SPARC T5-4 Server Installation Guide

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Contents

Using This Documentation 9

Understanding the Server 11
- Installation Task Overview 11
- Server Overview 12
- Front Panel Components 13
- Rear Panel Components 14

Confirming Specifications 17
- Physical Specifications 17
- Electrical Specifications 18
- Environmental Requirements 19
- Airflow Precautions 20

Preparing for Installation 23
- Shipping Kit (Part Number 7069640) 23
- Shipping Kit (Part Number 350-1662-02) 25
- Handling Precautions 26
- ESD Precautions 27
- Tools Needed for Installation 27
- ▼ Prepare the Server 28

Installing the Server 29
- Rack Compatibility 30
- Rack Cautions 31
- ▼ Stabilize the Rack 32
- Rackmount Kit (Part number 7069640) 32
- Rackmount Kit (Part number 350-1662-02) 34
- ▼ Determine Correct Rackmount Hardware 36
- ▼ Mark the Rackmounting Location 36

▼ Install the Rackmount Hardware 37
Installing the CMA 42
CMA Kit (CMA Comb, Part Number 7069793) 43
▼ Install the CMA Comb 44
CMA Kit (Multi-piece CMA, Part Number 7041990) 46
▼ Install the CMA (Multi-piece CMA) 46
Installing the Shipping Brace Assembly 48
Shipping Brace Assembly 48
▼ Determine Correct Shipping Brace Fasteners 50
▼ Install the Top Rear Braces 50
▼ Install the Bottom Rear Shipping Brace 51
▼ Remove the Bottom Rear Shipping Brace 52
▼ Install the Server 53

Connecting the Server Cables 55
Cabling Requirements 55
Identifying Ports 57
USB Ports 57
SER MGT Ports 58
NET MGT Port 59
Gigabit Ethernet Ports 60
VGA Port 60
Connecting Data and Management Cables 61
▼ Connect the SER MGT Cable 62
▼ Connect the NET MGT Cable 63
▼ Connect the Ethernet Network Cables 63
▼ Connect Other Data Cables 64
▼ Secure Cables Using the CMA 64

Powering On the Server for the First Time 67
▼ Prepare the Power Cords 67
▼ Connect a Terminal or Emulator to the SER MGT Port 68
▼ Power on the System for the First Time 70
Oracle ILOM System Console 71
Installing the OS 72
▼ Configure the Preinstalled OS 72
▼ Reach a State to Install a Fresh OS (Oracle ILOM CLI) 73
▼ Reach a State to Install a Fresh OS (Oracle ILOM Web Interface) 75
Oracle Solaris OS Configuration Parameters 77

Assigning a Static IP Address to the SP 78
▼ Log In to the SP (SER MGT Port) 79
▼ Assign a Static IP Address to the NET MGT Port 80

Glossary 83

Index 89

Using This Documentation

- **Overview** – Provides specifications, and describes how to install and power on Oracle's SPARC T5-4 server.
- **Audience** – Technicians, system administrators, and authorized service providers
- **Required knowledge** – Advanced experience installing and configuring hardware

Product Documentation Library

Late-breaking information and known issues for this product are included in the documentation library at http://www.oracle.com/goto/T5-4/docs.

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Provide feedback about this documentation at http://www.oracle.com/goto/docfeedback.

Understanding the Server

These topics list the installation tasks, provide an overview of the server, and highlight the key components.

- “Installation Task Overview” on page 11
- “Server Overview” on page 12
- “Front Panel Components” on page 13
- “Rear Panel Components” on page 14

Related Information

- “Install the Server” on page 53
- “Connecting the Server Cables”
- “Powering On the Server for the First Time”

Installation Task Overview

These are the tasks you will perform to install and configure the server.

Step	Description	Links
1.	Review the *SPARC T5-4 Server Product Notes* for any late-breaking news about the server.	*SPARC T5-4 Server Product Notes*
2.	Review the server features, specifications, and site requirements.	“Server Overview” on page 12 “Confirming Specifications”
3.	Confirm that you received all of the items you ordered.	“Shipping Kit (Part Number 7069640)” on page 23
4.	Learn the server features, controls, and LEDs required for installation.	“Front Panel Components” on page 13 “Rear Panel Components” on page 14
5.	Take safety and ESD precautions and assemble the required tools.	“Handling Precautions” on page 26 “ESD Precautions” on page 27 “Tools Needed for Installation” on page 27
6.	Install the server into a rack.	“Installing the Server”

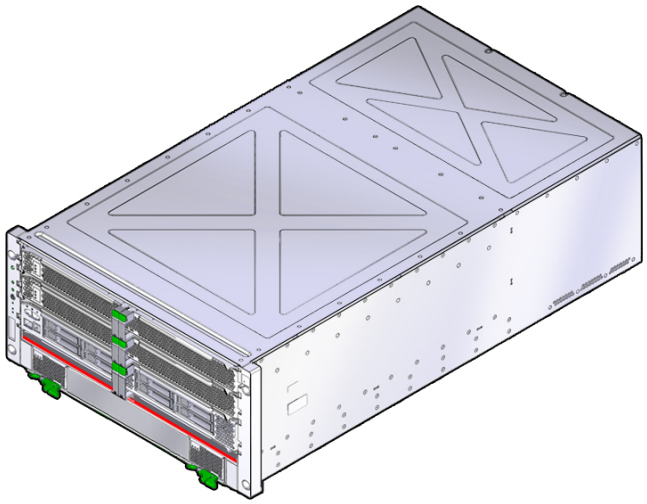
Step	Description	Links
7.	Attach data and management cables to the server.	"Connecting the Server Cables"
8.	Connect the power cords to the server, configure the Oracle ILOM SP, power on the server for the first time, and set up the operating system.	"Powering On the Server for the First Time"

Related Information

- Server Product Notes
- Server Safety and Compliance
- Servers Administration
- Server Service

Server Overview

This topic provides a high-level introduction to the main components and capabilities of the server.



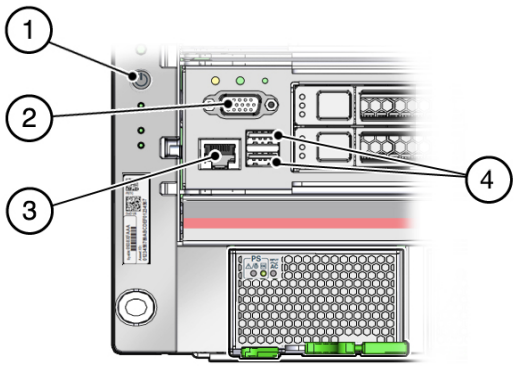
Component	Description
Chassis	Rack-mountable server with a 5RU form-factor.

Component	Description
CPU	2x or 4x SPARC T5, 16-core chip multiprocessor (CMP) with 8 threads per core.
Memory	64 DDR3 DIMM slots (capacities: 16 GB or 32 GB)
I/O expansion	Sixteen PCIe Gen3 card slots (x8 electrical interface).
Storage devices	For internal storage, the server provides: ■ Eight 2.5-inch hard drives (front panel). ■ A slot-loading USB-connected DVD+/-RW drive (front panel).
USB ports	Four external USB 3.0 ports (2 front, 2 rear).
Video ports	Two high-density HD-15 video ports (1 front, 1 rear).
Management ports	■ Two RJ-45 SER MGT ports (1 front, 1 rear) ■ One 10/100 NET MGT port (rear)
Network ports	Four 10GbE, 100/1000/10000 Mbps (rear)
Power supplies	Two hot-swappable AC 3000W redundant (1 + 1). Accessed on the front panel.
Fan modules	Five (N+1) hot-swappable, redundant fan modules at chassis rear.
SP	Oracle Integrated Lights Out Manager (Oracle ILOM).

Related Information

- Server Service
- Oracle ILOM documentation
- “Front Panel Components” on page 13
- “Rear Panel Components” on page 14

Front Panel Components



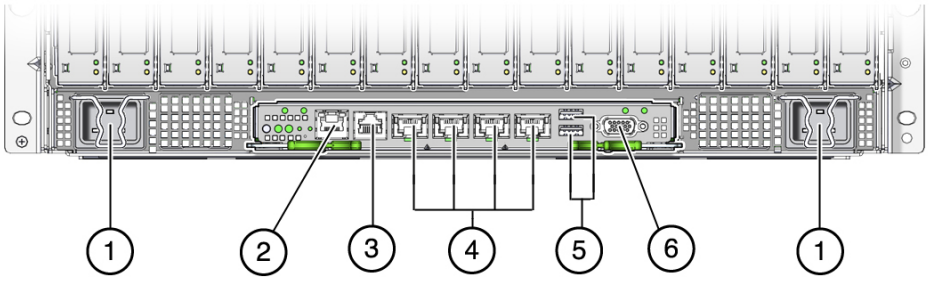
No.	Description
1	Power button
2	VGA port
3	SER MGT port
4	USB 3.0 ports

Related Information

- “Cabling Requirements” on page 55
- “Server Overview” on page 12
- “Rear Panel Components” on page 14

Rear Panel Components

Note - You must follow the proper sequence when connecting cables to the server. Do not connect the power cords until all data cables have been connected.



No.	Description	Links
1	Power supply unit AC inputs	
2	NET MGT RJ-45 network port	“NET MGT Port” on page 59
3	SER MGT RJ-45 serial port	“SER MGT Ports” on page 58
4	Network 10GbE ports: NET0—NET3	“Gigabit Ethernet Ports” on page 60
5	USB 3.0 ports	“USB Ports” on page 57
6	VGA port	“VGA Port” on page 60

Related Information

- “Front Panel Components” on page 13
- “Cabling Requirements” on page 55
- “Install the CMA Comb” on page 44
- “Secure Cables Using the CMA” on page 64

Confirming Specifications

These topics provide the technical information and airflow precautions you need to install the server.

- “Physical Specifications” on page 17
- “Electrical Specifications” on page 18
- “Environmental Requirements” on page 19
- “Airflow Precautions” on page 20

Related Information

- “Server Overview” on page 12
- “Shipping Kit (Part Number 7069640)” on page 23
- “Identifying Ports” on page 57

Physical Specifications

Description	U.S.	Metric
Rack units	5U	5U
Height	8.5 in.	215 mm
Width	17.5 in.	445 mm
Depth	31.5 in.	800 mm
Weight (without rackmount kit)		
Fully populated (two processor modules)	166 lb	75.4 kg
Half populated (one procesor module and one processor filler module)	154.675 lb	70.24 kg
Minimum service clearance (front)	36 in.	914.4 mm
Minimum service clearance (rear)	36 in.	914.4 mm
Minimum airflow clearance (front)	2 in.	50.8 mm

Description	U.S.	Metric
Minimum airflow clearance (rear)	3 in.	76.2 mm

Related Information

- “Server Overview” on page 12
- “Handling Precautions” on page 26
- “Installing the Server”
- “Electrical Specifications” on page 18
- “Environmental Requirements” on page 19
- “Airflow Precautions” on page 20

Electrical Specifications

Use these specifications only as a general planning guide. To determine power values based on expected workloads, use theSPARC T5-4 power calculator located at this online site:

http://www.oracle.com/goto/powercalculators/

Description	Value
Operating input range	200 to 240 VAC, 50-60 Hz
Maximum operating input current at 200 VAC (Actual amperage draw may exceed rating by no more than 10%)	15.3 A
Maximum operating input power at 200 VAC (Actual power draw may exceed rating by no more than 10%)	3000W
Maximum heat dissipation	11,233 BTU/hr 11,851 KJ/hr
Maximum standby power	140W
Maximum server configuration specification under nominal temperature and voltage conditions: (Four 3.6GHz T5 Processors, with sixty-four 32GB DDR3 DIMMS, 8 HDD and 16 I/O cards)	
Idle input power	1495 W
Peak AC input power (running SpecJBB)	3292 W
Minimum server configuration specification under nominal temperature and voltage conditions (Two 3.6GHz T5 Processors, with 32x 16GB DDR3 DIMMS, no HDD and no I/O cards)	

Description	Value
Idle input power	678 W
Peak AC input power (running SpecJBB)	1480 W

Note - The maximum operating input current values are based on the formula P / (V *0.90), where P = maximum operating input power and V = input voltage. For example: 620W / (100V * 0.90) = 6.89A You can use this formula to calculate the maximum operating current at your input voltage.

Caution - Use only the power cords provided with the server.

Related Information

- “Powering On the Server for the First Time”
- “Physical Specifications” on page 17
- “Environmental Requirements” on page 19
- “Airflow Precautions” on page 20

Environmental Requirements

This topic includes these specifications:

- Temperature, humidity, and elevation
- Shock and vibration
- Acoustic

TABLE 1 Temperature, Humidity, and Elevation Specifications

	Operating		Nonoperating		
Description	**U.S.**	**Metric**	**U.S.**	**Metric**	**Notes**
Temperature (maximum)	41 to 95??F at 0 to 3000 ft	5 to 35??C at 900m	-40 to 149??F at 0 to 3000 ft	-40 to 65??C at 900m	Decrease in maximum temperature: above 3000 ft. (900m), 1.8°F/1000 ft (1° C/300m)
Relative humidity	10 to 90% at 81??F	10 to 90% at 27??C	Up to 93% at 100??F	Up to 93% at 38??C	Maximum wet bulb, noncondensing
Altitude	0 to 9840 ft at 95°F[†]	0 to 3000m at 40??C[†]	Up to 40,000 ft	Up to 12,000m	

[†]Except in China markets where regulations may limit installations to a maximum altitude of 2km.

TABLE 2 Shock and Vibration Specifications

Description	Operating	Notes
Shock	3G, 11 ms	Half-sine
Vibration (vertical)	0.15G	5 to 500 HZ swept-sine
Vibration (horizontal)	0.10G	

TABLE 3 Acoustic Specifications

Description	Operating at Idle	Operating at Peak Power
Acoustic power (LwAd 1B= 10 dB)	7.8B	9.4B
Acoustic pressure level (LpAm: bystander positions)	61.8 dBA	79.7 dBA

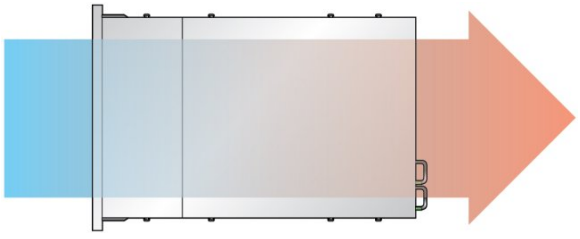
Related Information

- Server Safety and Compliance
- “Physical Specifications” on page 17
- “Electrical Specifications” on page 18
- “Environmental Requirements” on page 19
- “Airflow Precautions” on page 20

Airflow Precautions

Caution - Proper airflow is essential for keeping the server's internal temperatures within a safe operating range.

Air flows from the front to the rear of the server.



Follow these guidelines to ensure unrestricted airflow in the server:

- Adhere to the minimum airflow clearance specifications. See “Physical Specifications” on page 17.
- Install the server so the front faces the cool aisle and the rear faces the warm aisle.
- Do not direct warm air into the server.
- Prevent recirculation of air within a rack or cabinet.
- When servicing server internal components, ensure that air ducts and baffles are properly installed.
- Route cables so they do not interfere with airflow.

Related Information

- “Rack Cautions” on page 31
- “Physical Specifications” on page 17
- “Electrical Specifications” on page 18
- “Environmental Requirements” on page 19

Preparing for Installation

These topics detail the precautions to follow, the tools to assemble, and the tasks to perform prior to installing the server.

Step	Description	Links
1.	Confirm that you have received all the items you ordered for the type of CMA you will be using in your installation.	“Shipping Kit (Part Number 7069640)” on page 23 “Shipping Kit (Part Number 350-1662-02)” on page 25
2.	Review ESD and safety precautions.	“Handling Precautions” on page 26 “ESD Precautions” on page 27
3.	Verify that you have the correct tools.	“Tools Needed for Installation” on page 27
4.	Prepare the server for installation.	“Prepare the Server” on page 28

Related Information

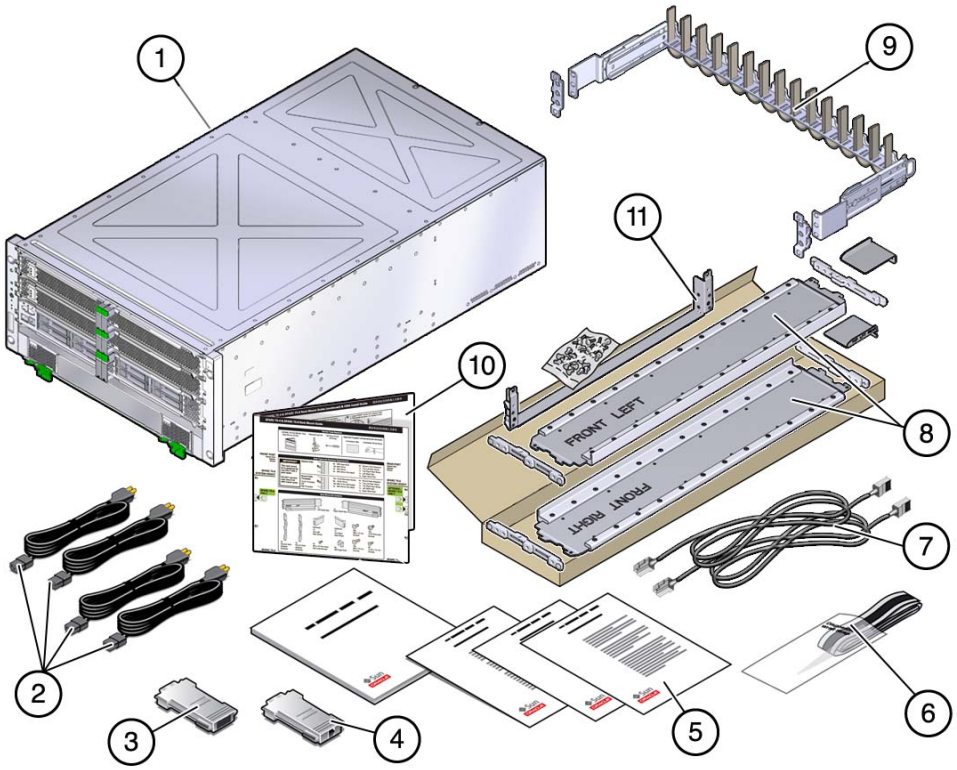
- “Installing the Server”
- “Connecting the Server Cables”
- “Powering On the Server for the First Time”

Shipping Kit (Part Number 7069640)

Verify that you have received all of the components that ship with your server.

This shipping kit includes the single-unit CMA comb. If your shipping kit includes the multi-piece CMA, see “Shipping Kit (Part Number 350-1662-02)” on page 25.

Note - When you receive the server, place it in the environment where you will install it. Leave it in its shipping crate at its final destination for 24 hours. This resting period prevents thermal shock and condensation.



No.	Description
1.	Server
2.	AC power cords (2)
3.	RJ-45 to DB-25 crossover adapter
4.	RJ-45 to DB-9 crossover adapter
5.	Print document kit
6.	Antistatic wrist strap
7.	Ethernet cables (2)
8.	Rackmounting kit
9.	CMA
10.	Rack Buddy template
11.	Bottom rear shipping brace

Related Information

- “Shipping Kit (Part Number 350-1662-02)” on page 25
- “Server Overview” on page 12

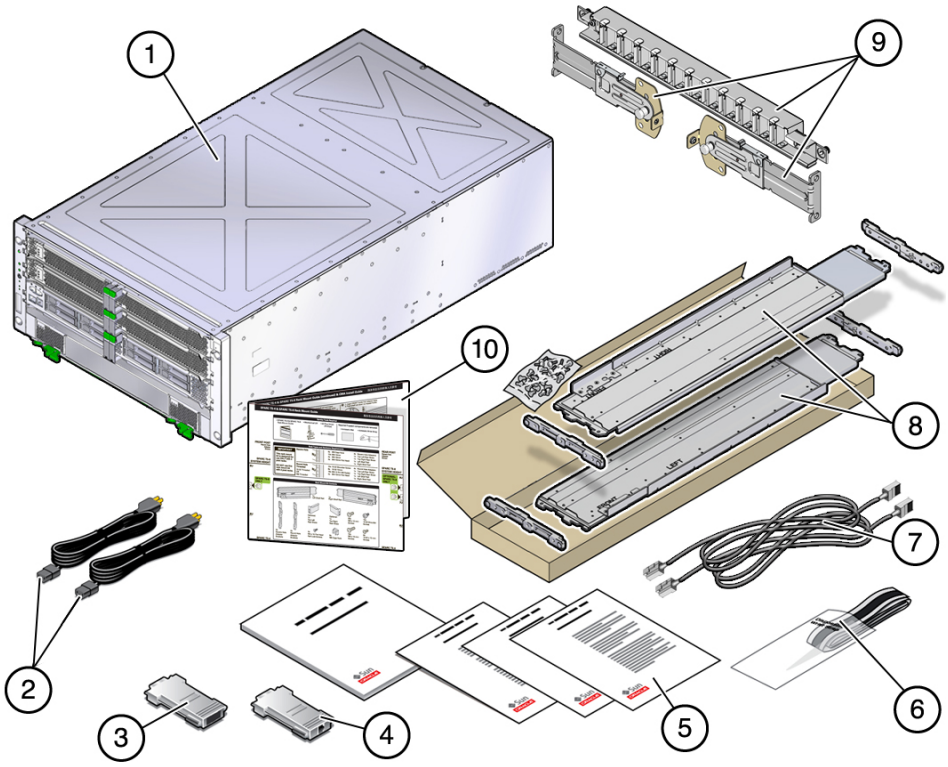
- “Rackmount Kit (Part number 7069640)” on page 32
- “Rackmount Kit (Part number 350-1662-02)” on page 34
- “CMA Kit (CMA Comb, Part Number 7069793)” on page 43
- “CMA Kit (Multi-piece CMA, Part Number 7041990)” on page 46

Shipping Kit (Part Number 350-1662-02)

Verify that you have received all of the components that ship with your server.

This shipping kit includes the multi-piece CMA. If your shipping kit includes the CMA comb, see “Shipping Kit (Part Number 7069640)” on page 23.

Note - When you receive the server, place it in the environment where you will install it. Leave it in its shipping crate at its final destination for 24 hours. This resting period prevents thermal shock and condensation.



No.	Description
1.	Server
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4.	RJ-45 to DB-9 crossover adapter
5.	Print document kit
6.	Antistatic wrist strap
7.	Ethernet cables (2)
8.	Rackmounting kit
9.	CMA
10.	Rack Buddy template

Related Information

- “Shipping Kit (Part Number 7069640)” on page 23
- “Server Overview” on page 12
- “Rackmount Kit (Part number 350-1662-02)” on page 34

Handling Precautions

Caution - Deploy the anti-tilt bar on the equipment rack before beginning an installation.

Caution - Always load equipment into a rack from the bottom up so that it will not become top-heavy and tip over.

Caution - Do not attempt to move the server alone without a lift. For a one-person installation, the main components must be removed and a lift must be used. For a two-person installation, the main components must be removed and a lift is optional.

Caution - Always communicate your intentions clearly before, during, and after each step of the rackmounting procedure to minimize confusion.

Related Information

- “Physical Specifications” on page 17
- “ESD Precautions” on page 27
- “Installing the Server”

- Server Getting Started

ESD Precautions

Electronic equipment is susceptible to damage by static electricity. Use a grounded antistatic wriststrap, footstrap, or equivalent safety equipment to prevent electrostatic damage when you install or service the server.

Caution - To protect electronic components from electrostatic damage, which can permanently disable the server or require repair by service technicians, place components on an antistatic surface, such as an antistatic discharge mat, an antistatic bag, or a disposable antistatic mat. Wear an antistatic grounding strap connected to a metal surface on the chassis when you work on server components.

Related Information

- “Handling Precautions” on page 26
- “Tools Needed for Installation” on page 27
- “Rack Cautions” on page 31

Tools Needed for Installation

- Long No. 2 Phillips screwdriver
- Cutters or heavy duty scissors
- Marking pen or tape
- ESD mat and grounding strap
- Hydraulic or mechanical lift (optional for two-person installation)

In addition, you must provide a system console device, such as one of the following:

- ASCII terminal
- Workstation
- Terminal server (optional to capture initial boot output)
- Patch panel connected to a terminal server

Related Information

- “Handling Precautions” on page 26

- "ESD Precautions" on page 27
- Server Service

▼ Prepare the Server

Caution - Do not attempt to move the server alone without a lift. For a one-person installation, the components must be removed and a lift must be used. For a two-person installation, the main components must be removed and a lift is optional.

1. **Remove the server from the box.**

   See "Shipping Kit (Part Number 7069640)" on page 23.

2. **Remove all of the processor modules, the main module, the power supplies, and the fan modules from the server.**

   Refer to the service manual for detailed instructions.

3. **Determine your next step:**

   - **For a one-person installation, place the server on a mechanical lift.**
   - **For a two-person installation, place the server on a mechanical lift if one is available.**

4. **Remove the PCIe card carriers if there are PCIe cards that need to be installed.**

   Refer to the service manual for detailed instructions.

5. **Install the server in the rack.**

   See "Install the Server" on page 53.

Related Information

- "Physical Specifications" on page 17
- "Handling Precautions" on page 26
- "ESD Precautions" on page 27

Installing the Server

These topics describe how to install the server into a rack equipped with square mounting holes. If you are installing the server into a rack equipped with round mounting holes, see “Determine Correct Rackmount Hardware” on page 36.

Note - If the rackmount kit came with its own instructions, use the instructions instead of the instructions in this chapter. After performing the server installation, proceed to “Powering On the Server for the First Time” for first-time power on.

Step	Description	Links
1.	Ensure that your rack is compatible with the server requirements.	“Rack Compatibility ” on page 30
2.	Determine the correct rackmounting hardware and install the hardware.	“Determine Correct Rackmount Hardware” on page 36 “Mark the Rackmounting Location” on page 36 “Install the Rackmount Hardware” on page 37
3.	(Optional) Install the CMA. There are two types of CMAs. Note which type you have for applicable instructions.	“Installing the CMA” on page 42
4.	If you are installing the server into a rack that will be shipped to another location, install the shipping brace assembly.	“Shipping Brace Assembly” on page 48
5.	Install the server in the rack.	“Install the Server” on page 53
6.	Review cabling requirements and port information. Attach data and management cables to the server.	“Connecting the Server Cables”
7.	Configure the Oracle ILOM SP and power on the server for the first time.	“Powering On the Server for the First Time”

Related Information

- “Understanding the Server”
- “Connecting the Server Cables”

Rack Compatibility

The rackmount kit is compatible with equipment racks that meet the following standards.

Item	Requirement
Rack types when used with the CMA comb, part number 7069793	1000-mm and 1200-mm racks
Rack type when used with the multi-piece CMA, part number 7041990	1200-mm rack only.
Structure	Four-post rack (mounting at both front and rear). Two-post racks are not compatible.
Rack horizontal opening and unit vertical pitch	Conforms to ANSI/EIA 310-D-1992 or IEC 60927 standards.
Rack rail mounting hole sizes	9.5-mm square holes, M6 round mounting holes and 10-32 mounting holes are supported. All other sizes, including 7.2-mm or M5 mounting holes, are *not* supported.
Distance between front and rear mounting planes	Minimum: 24 in. (240 mm) Maximum: 36 in. (915 m)
Clearance depth in front of front mounting plane	Distance to front rack door is at least 1 in. (25.4 mm).
Clearance depth behind front mounting plane	Distance to rear rack door is at least 34.6 in. (878.8 mm) with the cable management arm, or 31.5 in. (800 mm) without the cable management arm.
Clearance width between front and rear mounting planes	Distance between structural supports and cable troughs is at least 18.9 in. (480 mm).
Server dimensions	Depth: 31.5in. (800 mm) Width: 17.5 in. (445 mm) Height: 8.5 in. (215 mm)

Related Information

- “Physical Specifications” on page 17
- “Tools Needed for Installation” on page 27
- “Determine Correct Rackmount Hardware” on page 36
- “Rackmount Kit (Part number 7069640)” on page 32
- “Rackmount Kit (Part number 350-1662-02)” on page 34

Rack Cautions

Caution - Equipment Loading: Always load equipment into a rack from the bottom up so that the rack does not become top-heavy and tip over. Deploy the rack's anti-tilt bar to prevent the rack from tipping during equipment installation.

Caution - Elevated Operating Ambient Temperature: If the server is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment might be greater than room ambient temperature. Therefore, install the equipment only in an environment compatible with the maximum ambient temperature (Tma) specified for the server.

Caution - Reduced Air Flow: Install the equipment in a rack so that the amount of air flow is adequate for the safe operation of the equipment.

Caution - Mechanical Loading: Mount the equipment in the rack so that the weight is distributed evenly. A hazardous condition can exist with uneven mechanical loading.

Caution - Circuit Overloading: Do not overload the power supply circuits. Before connecting the server to the supply circuit, review the equipment nameplate power ratings and consider the effect that circuit overloading might have on overcurrent protection and supply wiring.

Caution - Reliable grounding: Maintain reliable grounding of rackmounted equipment. Give particular attention to supply connections other than direct connections to the branch circuit (for example, use of power strips).

Caution - Do not use slide rail mounted equipment as a shelf or a work space.

Caution - Do not attempt to move the server alone without a lift. For a one-person installation, all the components must be removed and a lift must be used. For a two-person installation, all the components must be removed and a lift is optional.

Caution - Due to the weight of the server, it should not be shipped while it is in a rack. Install the server into the rack only at its final location.

Caution - There are two rail kits for the SPARC T5-4 server. If you have installed the old rail kit (part number 350-1662-02) without the shipping brace, you cannot ship the server in the rack. If you have installed the new rail kit (part number 7069640) with the shipping braces, there is no restriction on shipping the server in a rack.

Related Information

- "Physical Specifications" on page 17
- "Handling Precautions" on page 26
- "Stabilize the Rack" on page 32

▼ Stabilize the Rack

Caution - To reduce the risk of personal injury, stabilize the rack by extending all anti-tilt devices before installing the server.

Refer to the rack documentation for detailed instructions for the following steps.

1. **Read the rack cautions and stabilize the rack.**

   See "Rack Cautions" on page 31.

2. **Open and remove the front and rear doors from the rack.**

3. **To prevent the rack from tipping during the installation, stabilize the rack using all anti-tilt mechanisms provided.**

4. **If there are leveling feet beneath the rack to prevent it from rolling, extend these leveling feet fully downward to the floor.**

Related Information

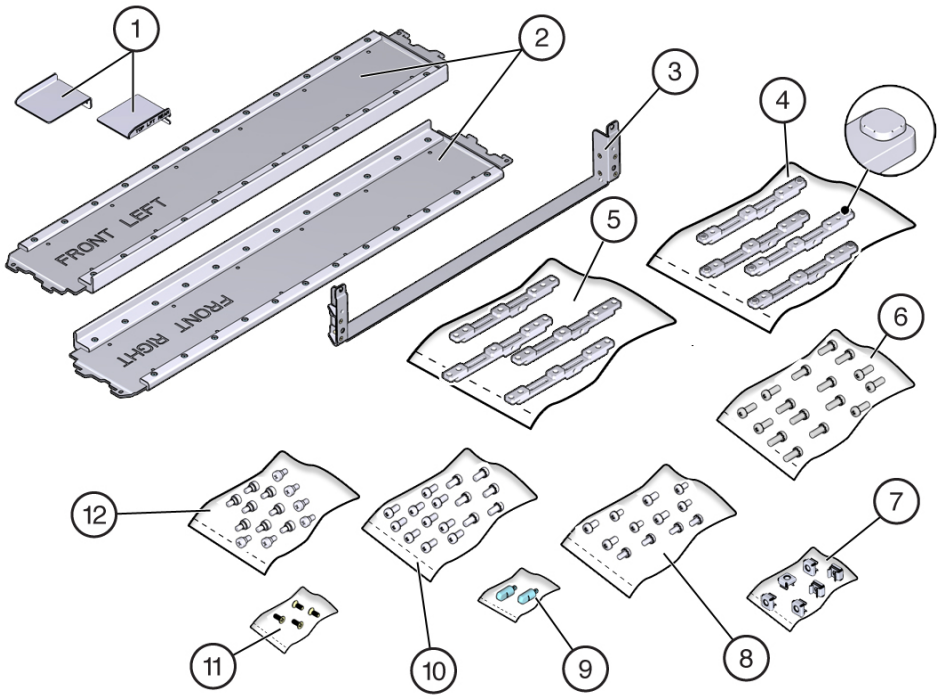
- "Rackmount Kit (Part number 7069640)" on page 32
- "Rackmount Kit (Part number 350-1662-02)" on page 34
- Rack documentation
- *SPARC T5-4 Server Safety and Compliance Guide*
- "Rack Compatibility " on page 30
- "Rack Cautions" on page 31

Rackmount Kit (Part number 7069640)

This rackmount kit includes the CMA comb. If your rackmount kit includes the multi-piece CMA, see "Rackmount Kit (Part number 350-1662-02)" on page 34.

The rackmount kit has two shelf rails, one for each side of the rack. Each shelf rail is marked LEFT or RIGHT.

The shelf rails are mounted to the rack or rack with four adaptor brackets. The shelf rails adjust to fit rack depths from 25 to 34.25 in. (63.5 to 87 cm).



No.	Description
1.	Top rear brace (right and left)
2.	Shelf rails
3.	Bottom rear shipping brace
4.	Adapter bracket (for square mounting holes)
5.	Adapter bracket (for round mounting holes)
6.	M6 16-mm screws (16)
7.	Cage nuts (4)
8.	10-mm screws (12)
9.	Guide pin (2)
10.	M6 12-mm screws (16)
11.	M4 Flathead screws (4)

No.	Description
12.	M6 16-mm screws (12)

Related Information

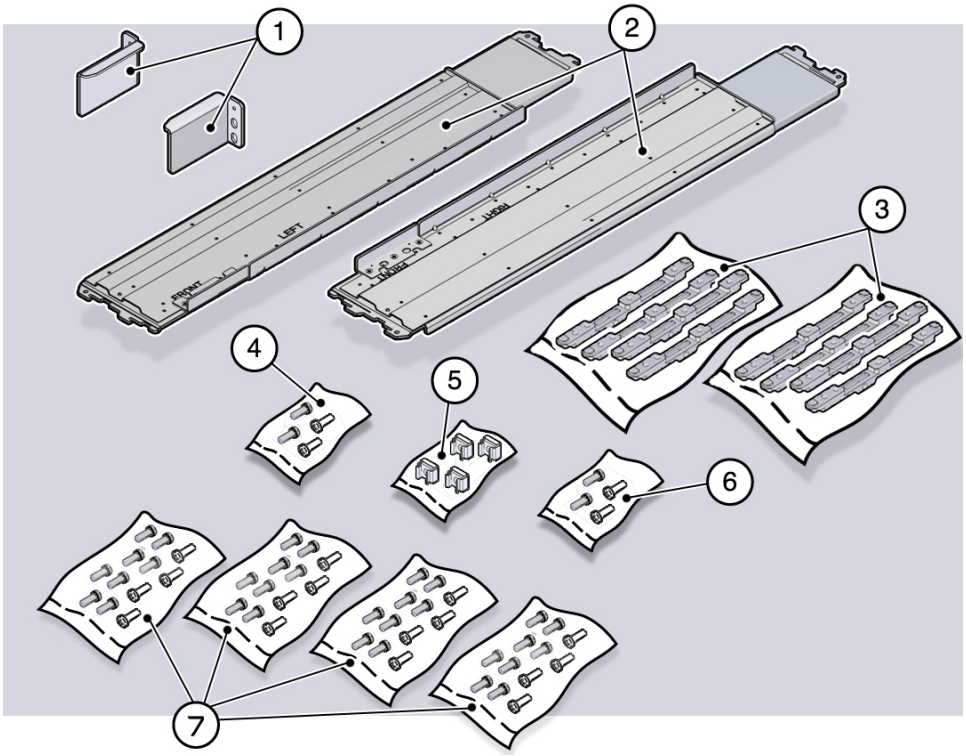
- “Rackmount Kit (Part number 350-1662-02)” on page 34
- “Tools Needed for Installation” on page 27
- “Install the Rackmount Hardware” on page 37
- “Rack Compatibility ” on page 30
- “Determine Correct Rackmount Hardware” on page 36

Rackmount Kit (Part number 350-1662-02)

This rackmount kit includes the multi-piece CMA. If your rackmount kit includes the CMA comb, see “Rackmount Kit (Part number 7069640)” on page 32.

The rackmount kit has two shelf rails, one for each side of the rack. Each shelf rail is marked LEFT or RIGHT.

The shelf rails are mounted to the rack or rack with four adaptor brackets. The shelf rails adjust to fit rack depths from 25 to 34.25 in. (63.5 to 87 cm).



No.	Description
1.	Upper rear brackets
2.	Shelf rails
3.	Adapter brackets (two types provided, for racks with either square mounting holes or round mounting holes)
4.	Flathead screws
5.	Cage nuts
6.	M6 screws
7.	Rackmount screws

Related Information

- “Rackmount Kit (Part number 7069640)” on page 32
- “Tools Needed for Installation” on page 27
- “Install the Rackmount Hardware” on page 37
- “Rack Compatibility ” on page 30
- “Determine Correct Rackmount Hardware” on page 36

▼ Determine Correct Rackmount Hardware

- **Determine the hardware needed for your rack installation.**

Rack Type	Fastener Bags Required
Square hole	SCREW, SEMS, M6 X 16 CAGE NUTS, M6 SCREW, FLAT HEAD, M4 X 10
Round hole (10-32) with corner bezel	SCREW, SEMS, 10-32 X 10 SCREW, FLAT HEAD, M4 X 10
Round hole (M6) with corner bezel	SCREW, SEMS, M6 X 12 SCREW, FLAT HEAD, M4 X 10
Round hole (10-32) inside installation	SCREW, SHOULDER, 10-32 SCREW, FLAT HEAD, M4 X 10
Round hole (M6) inside installation	SCREW, SEMS, M6 X 12 SCREW, FLAT HEAD, M4 X 10

Note - Some of the fastener bags that are included in the kit are not required to install this server.

Related Information

- “Rackmount Kit (Part number 7069640)” on page 32
- “Rackmount Kit (Part number 350-1662-02)” on page 34
- “Rack Compatibility ” on page 30
- “Mark the Rackmounting Location” on page 36
- “Install the Rackmount Hardware” on page 37

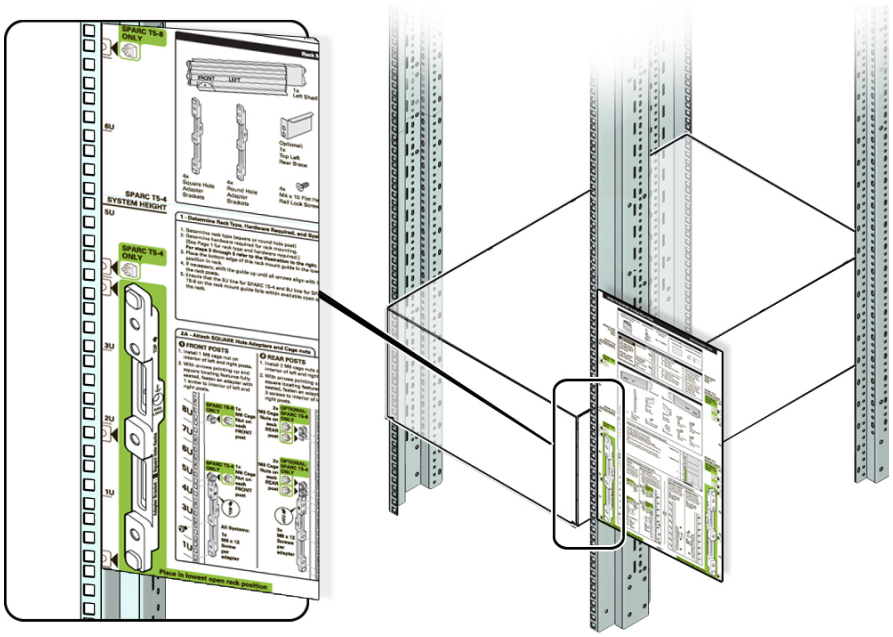
▼ Mark the Rackmounting Location

Use the Rack Buddy template to identify the correct mounting holes for the shelf rails.

Note - Load the rack from bottom to top.

1. **Ensure that there is enough vertical space in the rack to install the server.**
2. **Place the Rack Buddy template against the front rails.**

The bottom edge of the template corresponds to the bottom edge of the server. Measure up from the bottom of the template.



3. **Mark the mounting holes for the front shelf rails.**
4. **Mark the mounting holes for the rear shelf rails.**

Related Information

- “Rackmount Kit (Part number 7069640)” on page 32
- “Rackmount Kit (Part number 350-1662-02)” on page 34
- “Rack Compatibility ” on page 30
- “Determine Correct Rackmount Hardware” on page 36
- “Install the Rackmount Hardware” on page 37

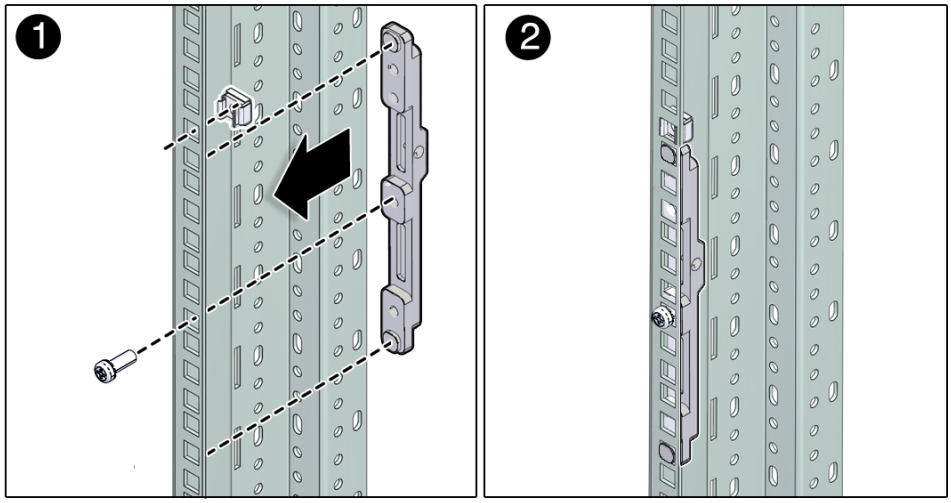
▼ Install the Rackmount Hardware

1. **Repeat the following steps for both the left and right front mounting points:**
   a. **Place the adapter bracket in the marked location.**

Note - An “up” arrow indicates proper orientation.

b. Secure the adapter bracket in the center hole using one No. 2 Phillips screw.

c. Insert a cage nut in the hole just above the top of the rack rail bracket.

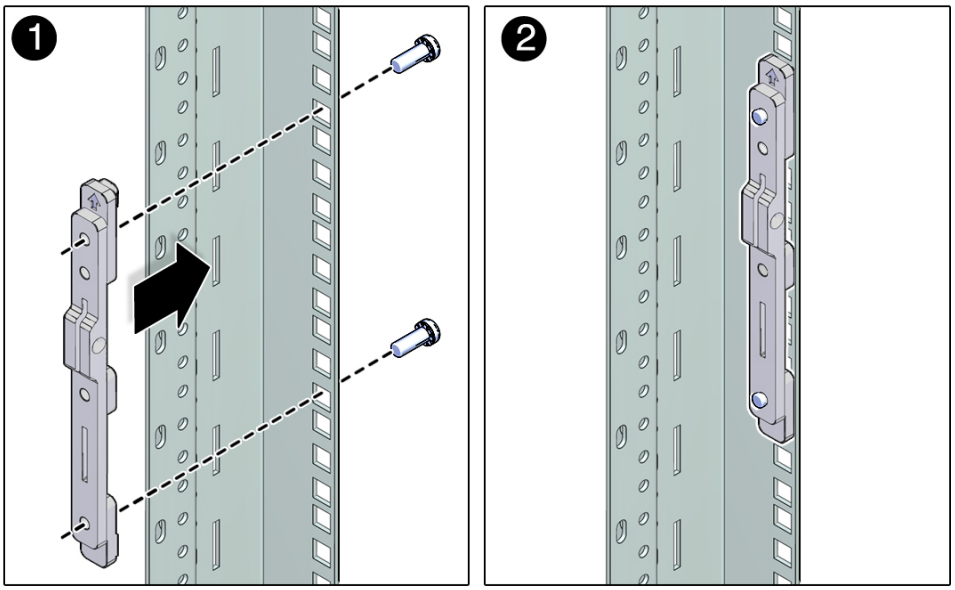


2. Repeat the following steps for both the left and right rear mounting points:

a. Place the adapter bracket in the marked location.

Note - An “up” arrow indicates proper orientation.

b. Secure the adapter bracket top and bottom holes using two No. 2 Phillips screws.



3. Install the shelf rails.

Note - The shelf rails are marked “FRONT LEFT” and “FRONT RIGHT” (as viewed from the front of the server).

---

a. Position the left shelf rail between the front and rear rack posts.

The shelf rail slides in and out to fit racks of different depths.

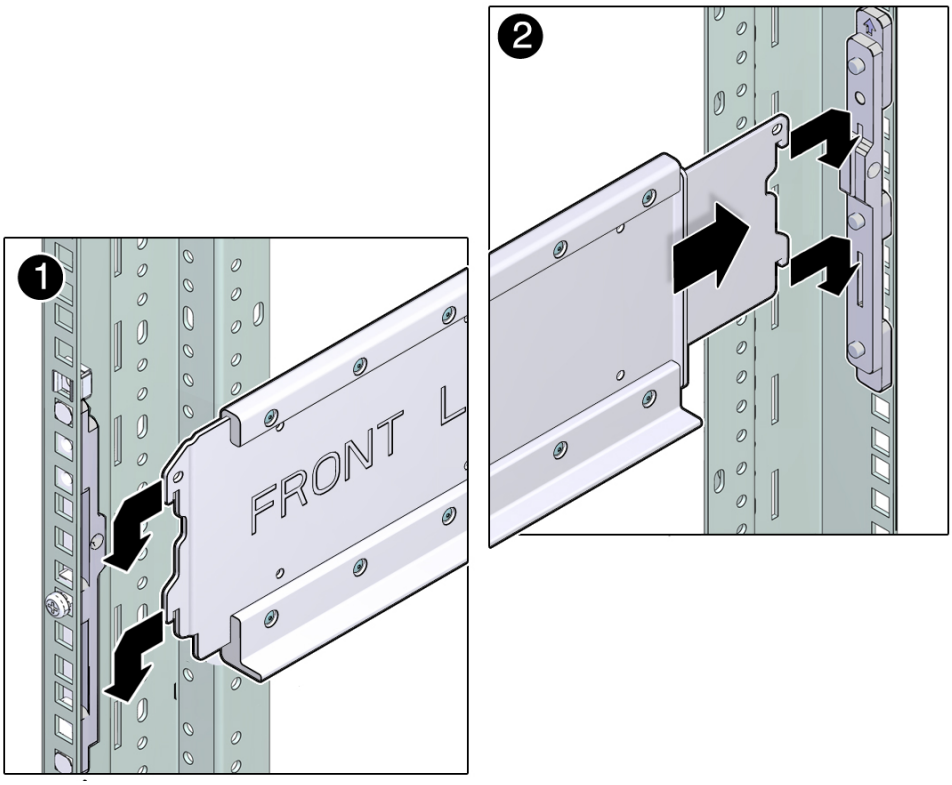
b. Extend the shelf rail and insert the rear hooks into the adapter slots.

c. Push the shelf rail down to engage the hooks.

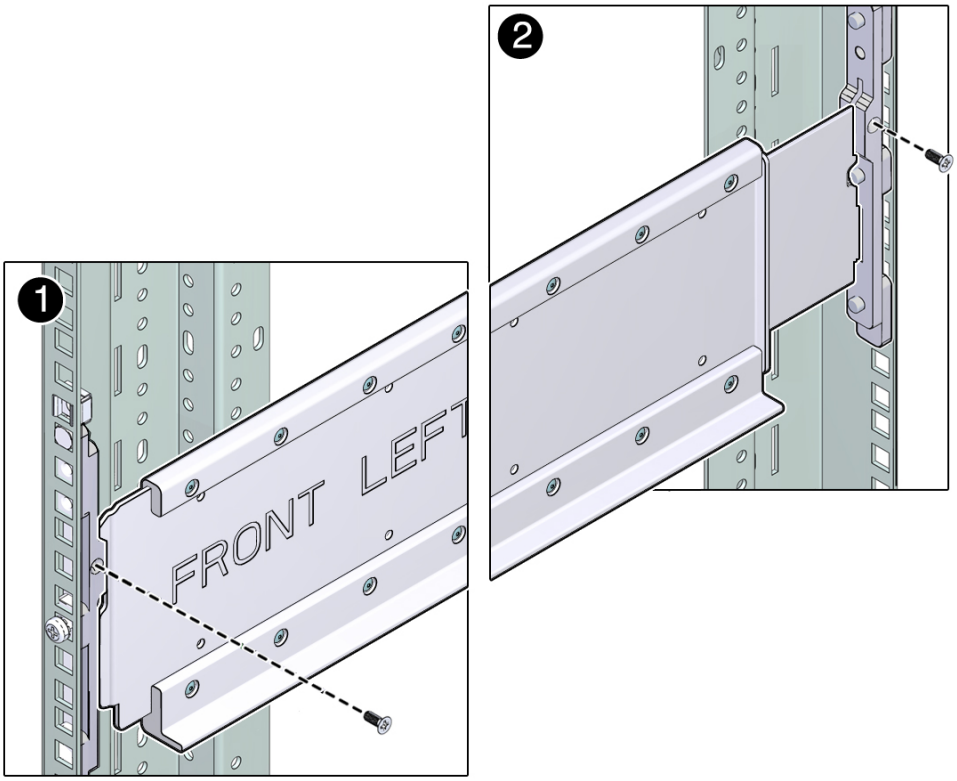
d. Insert the front hooks into the adapter slots.

e. Push the shelf rail down to engage the hooks.

f. Repeat steps a - e for the right shelf rail and confirm all the rail hooks are fully engaged in front and rear adapters.



g. **Secure each shelf rail with two rail lock screws (one M4 x 10 flat head screw on each adapter bracket).**



4. **Consider your next step.**

   - **If you are installing a CMA, see "Installing the CMA" on page 42.**
   - **If you are installing the server into an equipment rack that will be shipped to another location, see "Installing the Shipping Brace Assembly" on page 48.**
   - **If you are installing the server, see "Installing the Server".**

Related Information

- "Rackmount Kit (Part number 7069640)" on page 32
- "Rackmount Kit (Part number 350-1662-02)" on page 34

- “Rack Compatibility ” on page 30
- “Rack Cautions” on page 31

Installing the CMA

The cable management assembly is an optional kit for managing and routing power and data cables attached to the back of the server. There are two types of CMAs and rail kits. Determine which type you have for applicable installation instructions.

Note - This server with the multi-piece CMA (part number 7041990) attached will fit only into a 1200-mm rack.

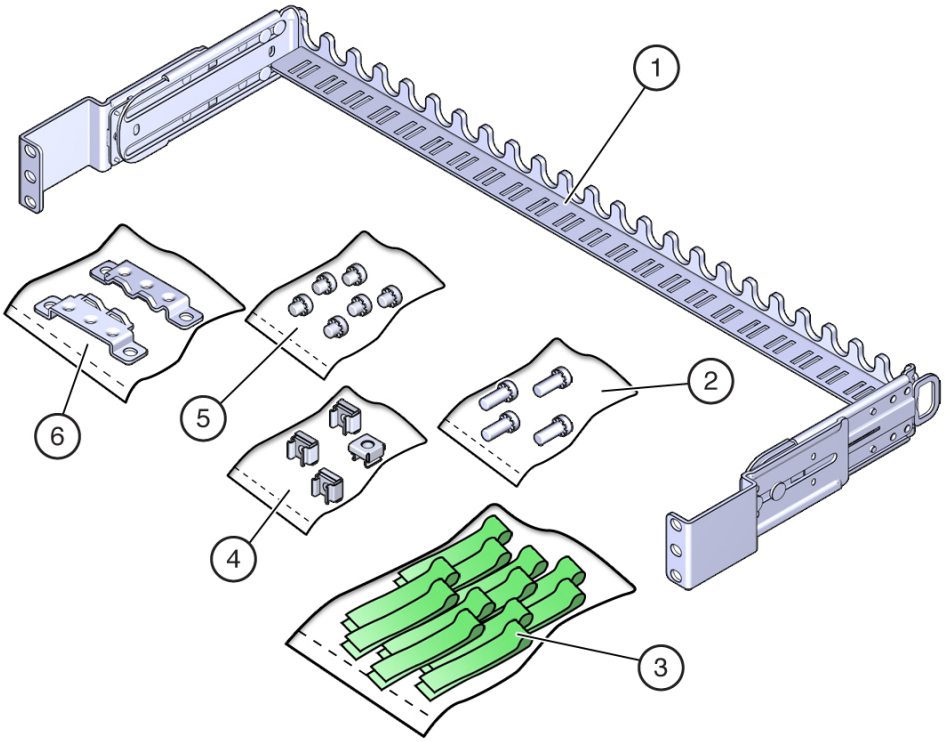
These topics provide the information and tasks needed to install the CMA:

- “CMA Kit (CMA Comb, Part Number 7069793)” on page 43
- “Install the CMA Comb” on page 44
- “CMA Kit (Multi-piece CMA, Part Number 7041990)” on page 46
- “Install the CMA (Multi-piece CMA)” on page 46
- “Secure Cables Using the CMA” on page 64

Related Information

- “Rackmount Kit (Part number 7069640)” on page 32
- “Rackmount Kit (Part number 350-1662-02)” on page 34
- “Determine Correct Rackmount Hardware” on page 36
- “CMA Kit (CMA Comb, Part Number 7069793)” on page 43
- “CMA Kit (Multi-piece CMA, Part Number 7041990)” on page 46
- “Secure Cables Using the CMA” on page 64

CMA Kit (CMA Comb, Part Number 7069793)



No.	Description
1.	CMA comb
2.	M6 16-mm screws (4)
3.	Hook and loop straps (14)
4.	M6 cage nuts (4)
5.	M6 6-mm screws (6)
6.	Bracket adapters (2)

Related Information

- “Determine Correct Rackmount Hardware” on page 36
- “Install the CMA Comb” on page 44
- “Secure Cables Using the CMA” on page 64

Install the CMA Comb

You will be installing the single-unit CMA comb. For installation of the multi-piece CMA, see "Install the CMA (Multi-piece CMA)" on page 46.

The CMA is attached to the rear posts of the rack.

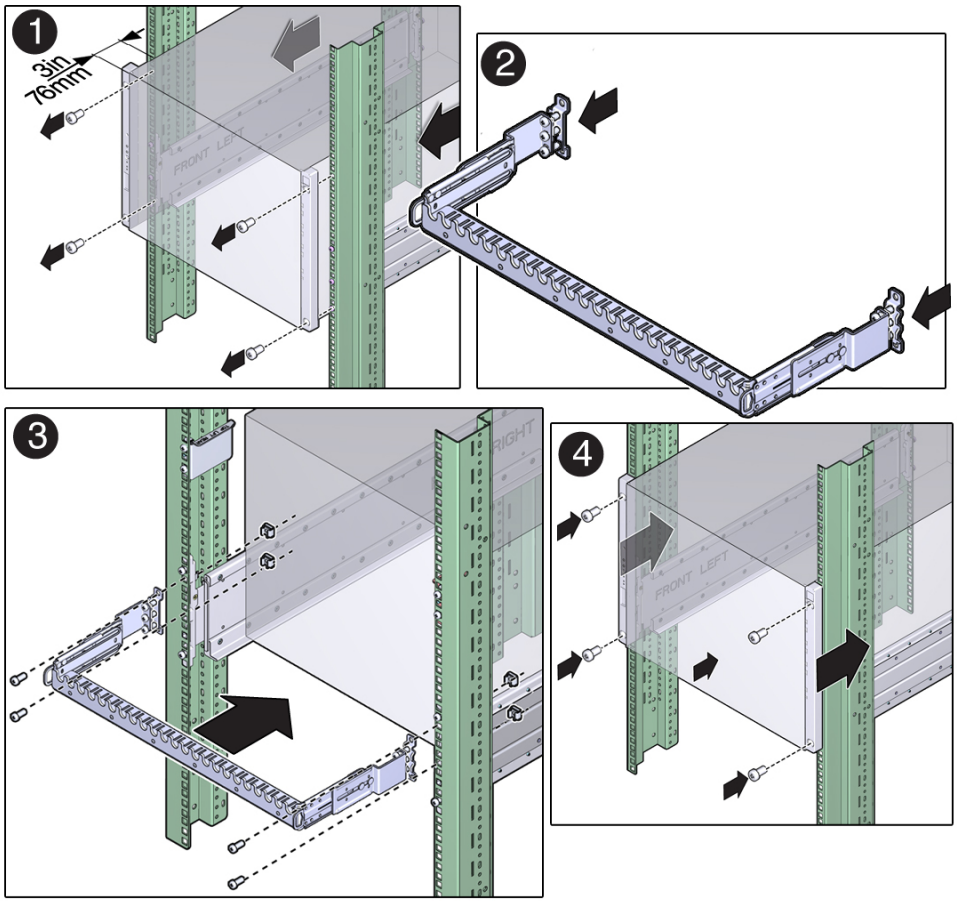
Note - The CMA installation might block some of the power outlets in the rack, making them unavailable.

1. **Confirm that you have the correct hardware to install the CMA ("Determine Correct Rackmount Hardware" on page 36).**
2. **At the front of the system, remove four screws, two per side.**
3. **At the rear of the system, on square hole racks, remove the middle adapter screw on each side and push the system forward 3 in. (76 mm).**

Caution - Do not remove the top adapter screw on the square hole racks.

4. **Attach the left and right CMA brackets to the comb, using three M6 screws per side.**
5. **Attach the CMA comb to the rack posts, using two M6 screws per side.**
6. **At the front of the system, push the system back until it touches the rails.**

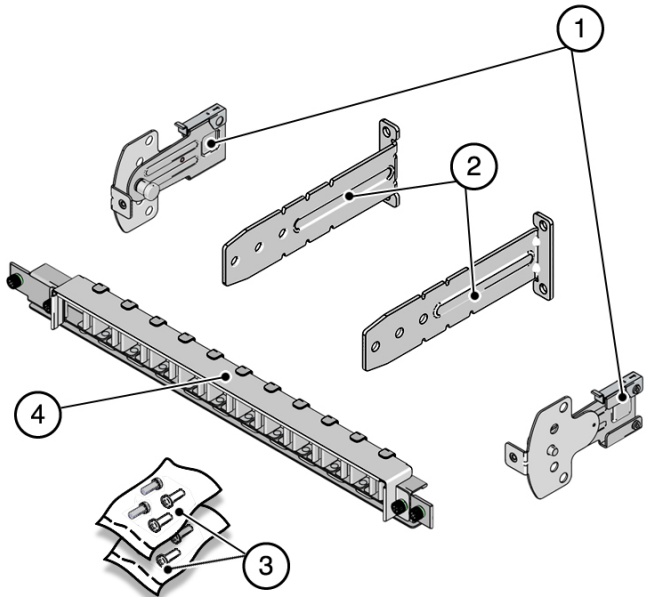
7. **Reinstall the four screws, two per side.**



Related Information

- “CMA Kit (CMA Comb, Part Number 7069793)” on page 43
- “Determine Correct Rackmount Hardware” on page 36

CMA Kit (Multi-piece CMA, Part Number 7041990)



No.	Description
1.	Swivel clips
2.	L brackets
3.	Fasteners
4.	CMA

Related Information

- “Determine Correct Rackmount Hardware” on page 36
- “Install the CMA Comb” on page 44
- “Secure Cables Using the CMA” on page 64

▼ Install the CMA (Multi-piece CMA)

You will be installing the multi-piece CMA. For installation of the single-unit CMA comb, see “Install the CMA Comb” on page 44.

The CMA is attached to the rear posts of the rack.

Note - The CMA installation might block some of the power outlets in the rack, making them unavailable.

1. **Install the L brackets at the rear.**

   The brackets are marked “Left” and “Right” as viewed from the back of the server.

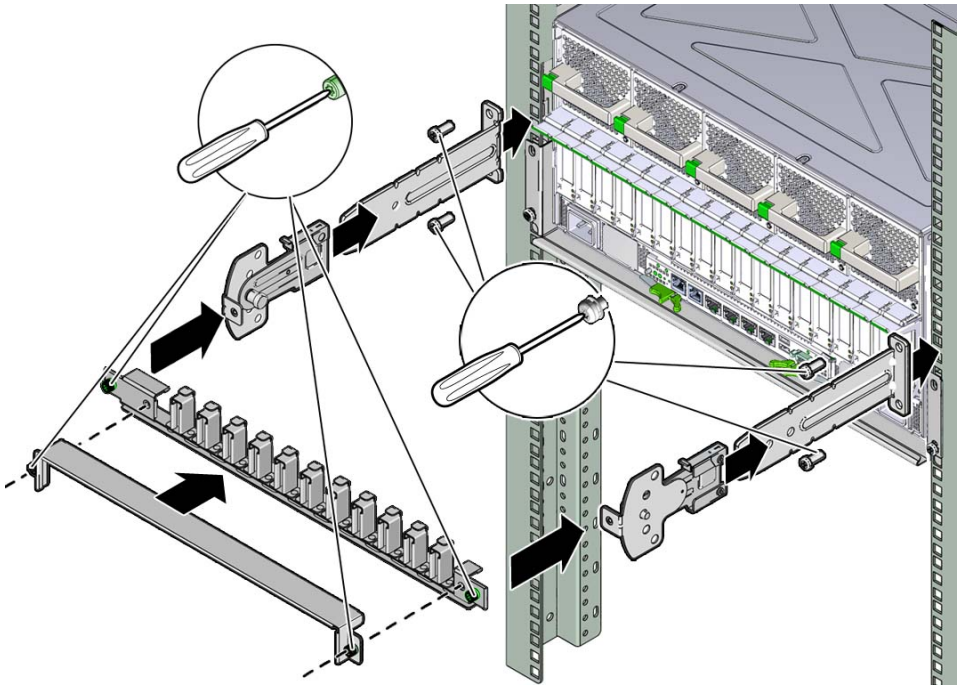
   Repeat for left and right sides:

   a. **Identify the left and right side brackets.**

   b. **Remove the two middle screws from the rackmount adapter.**

   c. **Place the bracket over the center two mounting holes.**

   d. **Secure each mounting bracket with two No. 2 Phillips screws.**



2. **Slide the left and right swivel clips into the left and right L brackets.**

3. **Secure the CMA with the two captive screws.**

Related Information

- “CMA Kit (CMA Comb, Part Number 7069793)” on page 43
- “Determine Correct Rackmount Hardware” on page 36

Installing the Shipping Brace Assembly

This shipping brace assembly is included in the shipping kit with the CMA comb, part number 7069640. Use these procedures if you are installing the server into an equipment rack that will be shipped to another location.

Note - These procedures describe how to install the server into a rack with square mounting holes. If you are installing the server into a rack with round mounting holes, see “Determine Correct Rackmount Hardware” on page 36.

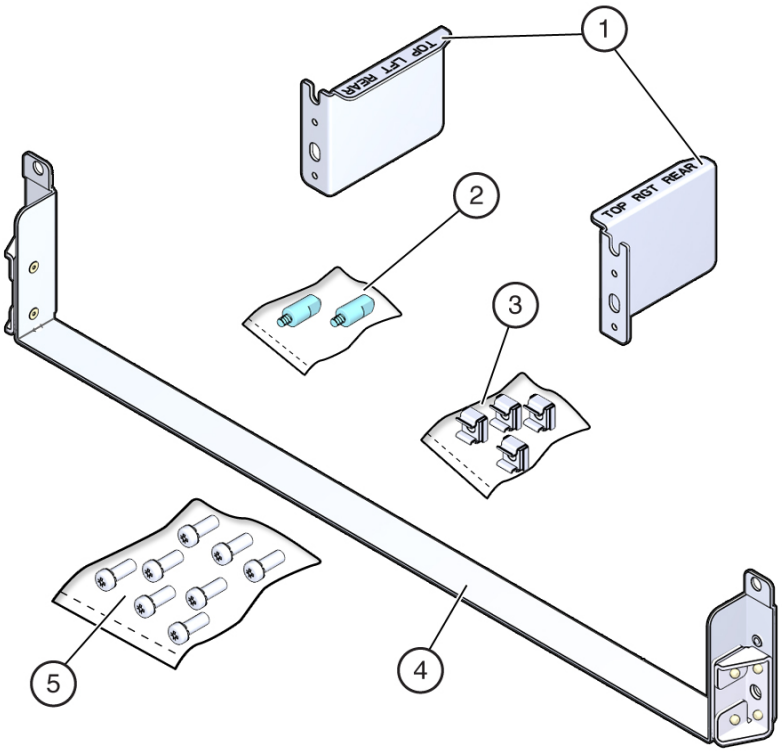
- “Determine Correct Shipping Brace Fasteners” on page 50
- “Install the Top Rear Braces ” on page 50
- “Install the Bottom Rear Shipping Brace ” on page 51

Related Information

- “Rack Compatibility ” on page 30
- “Determine Correct Rackmount Hardware” on page 36
- “Mark the Rackmounting Location” on page 36
- “Install the Server” on page 53

Shipping Brace Assembly

The shipping brace assembly provides extra shock and vibration protection. Use this kit when installing the server into a vehicle, or when you are installing the server into an equipment rack that will be shipped to another location for final installation.



No.	Description
1.	Top rear shipping brace (2)
2.	Guide pins (2)
3.	Cage nuts (4)
4.	Bottom rear shipping brace
5.	Screws (8)

Related Information

- “Tools Needed for Installation” on page 27
- “Rack Compatibility ” on page 30
- “Determine Correct Rackmount Hardware” on page 36
- “Mark the Rackmounting Location” on page 36

Determine Correct Shipping Brace Fasteners

- **Determine the correct fasteners for your shipping brace installation.**

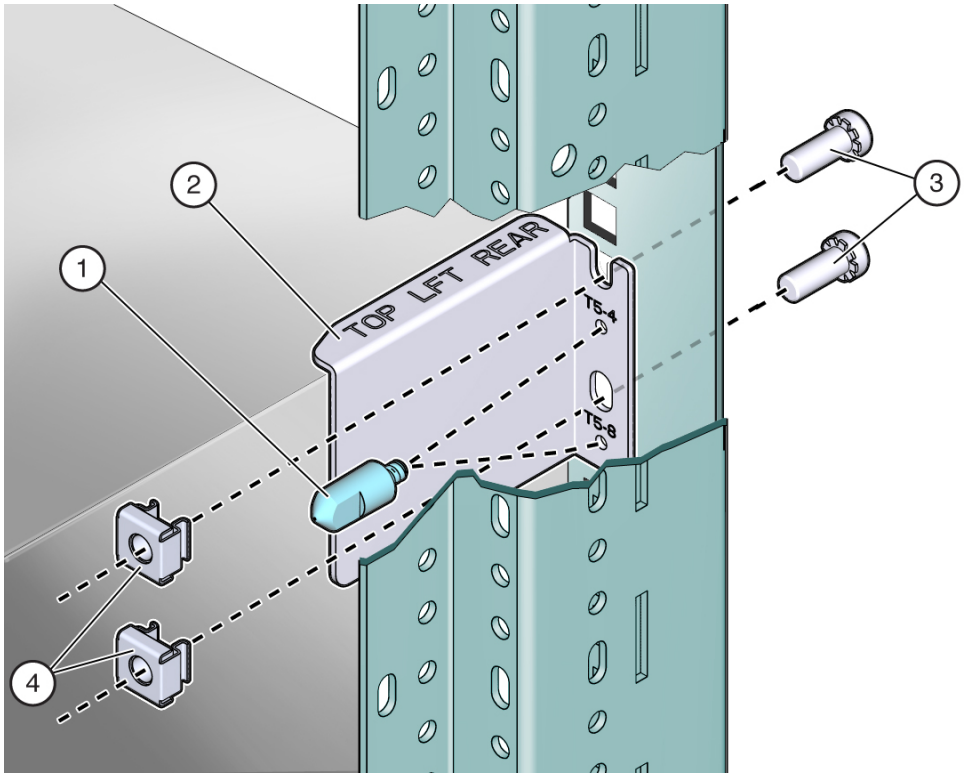
Rack Type	Fastener Bags Required
Square hole with corner bezel	SCREW, SEMS, M6 X 16MM SCREW, SEMS, M6 X 30MM
Tapped hole (10-32)	SCREW, SEMS, 10-32 X 1-1/4” SCREW, SEMS, 10-32 X 10MM
Tapped hole (M6)	SCREW, SEMS, M6 X 16MM SCREW, SEMS, M6 X 30MM

Install the Top Rear Braces

Before You Begin The rear braces are labeled left and right as viewed from the rear of the rack.

1. **Install two cage nuts into the left rear rack post above the adapter bracket.**
2. **Position the top left brace on the left rear rack post above the adapter.**
3. **Insert and finger-tighten the guide pin in the appropriate hole for your server.**
4. **Secure the brace with two M6 x 12-mm screws.**

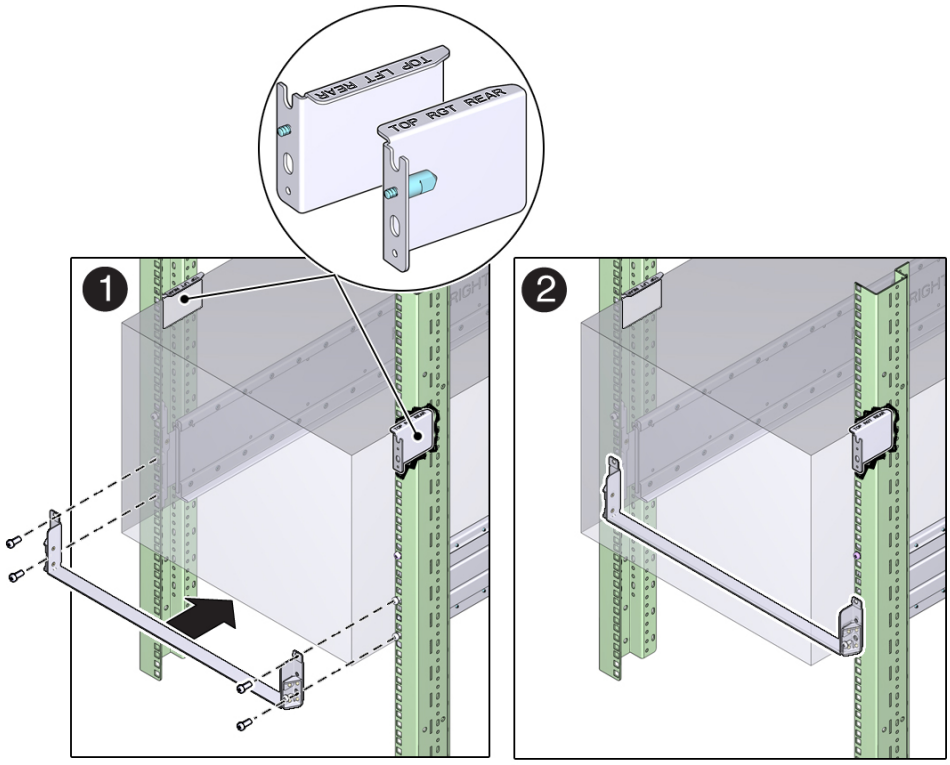
5. **Repeat steps 1-4 for the top right brace.**



▼ Install the Bottom Rear Shipping Brace

1. **Hold the shipping brace at the bottom rear of the system.**

2. **Install two No. 2 Phillips screws in each side of the shipping brace.**



▼ Remove the Bottom Rear Shipping Brace

Remove the bottom shipping brace after the server rack reaches its final destination.

1. **Remove the four screws that secure the bottom shipping brace to the rack.**
2. **Slide the shipping brace out from the rear of the rack.**

Related Information

- “Tools Needed for Installation” on page 27
- “Rack Compatibility ” on page 30
- “Determine Correct Rackmount Hardware” on page 36
- “Mark the Rackmounting Location” on page 36

Install the Server

Caution - Do not attempt to move the server alone without a lift. For a one-person installation, all the components must be removed and a lift must be used. For a two-person installation, all the components must be removed and a lift is optional.

Caution - There are two rail kits for the SPARC T5-4 server. If you have installed the old rail kit (part number 350-1662-02) without the shipping brace, you cannot ship the server in the rack. If you have installed the new rail kit (part number 7069640) with the shipping braces, there is no restriction on shipping the server in a rack.

1. **Prior to installing the server, confirm that you have removed all of the processor modules, the main module, the power supplies and the fan modules.**

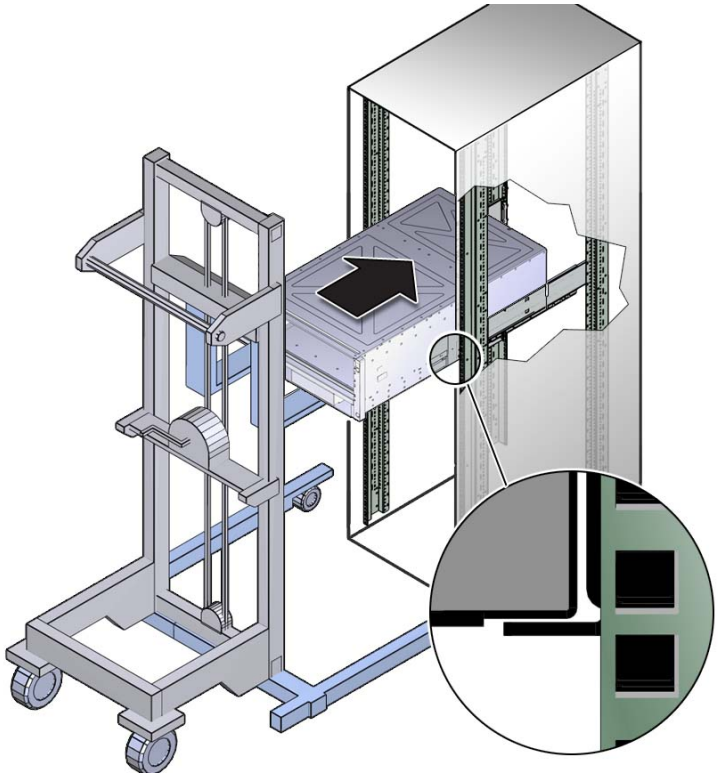
   For instructions on how to remove these components, refer to the service manual.

2. **If using a mechanical lift, ensure the lift is level and stable.**

3. **Lift the server up to the correct height.**

4. **Slide the server into the rack.**

Ensure that the bottom edge of the server has cleared the bottom of the rack rails.



5. **Secure the server to the front panel using four No. 2 Phillips screws.**

6. **Replace all of the components that you removed.**

   For instructions on how to install these components, refer to the service manual.

Related Information

- “Rack Compatibility ” on page 30
- “Rack Cautions” on page 31
- “Stabilize the Rack” on page 32
- “Rackmount Kit (Part number 7069640)” on page 32
- “Rackmount Kit (Part number 350-1662-02)” on page 34

Connecting the Server Cables

These tasks describe how to connect and configure the network and serial ports before you attempt to boot the server.

Step	Description	Links
1.	Review the cabling requirements.	"Cabling Requirements" on page 55
2.	Review the front and rear panel connectors and ports.	"Front Panel Components" on page 13 "Rear Panel Components" on page 14 "Identifying Ports" on page 57
3.	Connect the management and data cables.	"Connecting Data and Management Cables" on page 61
4.	Secure the cables with the CMA.	"Secure Cables Using the CMA" on page 64

Related Information

- "Understanding the Server"
- "Rear Panel Components" on page 14
- "Installing the Server"
- "Powering On the Server for the First Time"

Cabling Requirements

- Minimum cable connections for the server:
  - At least one server on-board Ethernet network connection (NET port)
  - Serial management port (SER MGT port): SP local connection with OBP output
  - Network management port (NET MGT port): SP remote connection without OBP output
  - Power cables for the server power supplies

Note - To ensure full N+1 power redundancy, connect the power cables to two separate power sources wired to separate circuits.

- **SP management ports:** There are two SP management ports for use with the ILOM SP.
  - The SER MGT port uses an RJ-45 cable and is always available. This port is the default connection to the ILOM SP.
  - The NET MGT port is the optional connection to the ILOM SP. The NET MGT port is configured to use DHCP by default. To set a static IP address, see "Assigning a Static IP Address to the SP" on page 78. The SP network management port uses an RJ-45 cable for a 10/100 BASE-T connection.
- **Ethernet ports** are labeled NET0, NET1, NET2, and NET3. The Ethernet interfaces operate at 100 Mbps, 1000 Mbps, and 10000 Mbps.

Connection Type	IEEE Terminology	Transfer Rate
Fast Ethernet	100BASE-T	100 Mbits/sec
Gigabit Ethernet	1GBASE-T	1000 Mbits/sec
10 Gigabit Ethernet	10GBASE-T	10000 Mbits/sec

Note - To achieve 1-GbE network speeds, use Category 6 (or better) cables and network devices that support 1000BASE-T networks.

- USB Ports: USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices while the server is running without affecting server operations.
  - You can perform USB hot-plug operations only while the OS is running. USB hot-plug operations are not supported when the server `ok` prompt is displayed or before the server has completed booting.
  - You can connect up to 126 devices to each of the four USB controllers, for a total of 504 USB devices per server.
- AC power cables: Do not attach power cables to the power supplies until you have finished connecting the data cables and have connected the server to a serial terminal or a terminal emulator (PC or workstation). The server goes into Standby mode and the Oracle ILOM SP initializes as soon as the AC power cables are connected to the power source. System messages will not be displayed if the server is not connected to a terminal, PC, or workstation.

Related Information

- "Connect the SER MGT Cable" on page 62
- "Connect the NET MGT Cable" on page 63
- "Connect the Ethernet Network Cables" on page 63
- "Prepare the Power Cords" on page 67

Identifying Ports

- “USB Ports” on page 57
- “SER MGT Ports” on page 58
- “NET MGT Port” on page 59
- “Gigabit Ethernet Ports” on page 60
- “VGA Port” on page 60

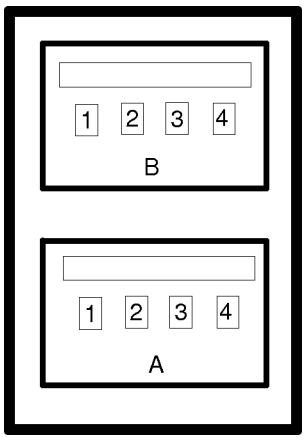
Related Information

- “Server Overview” on page 12
- “Front Panel Components” on page 13
- “Rear Panel Components” on page 14
- “Cabling Requirements” on page 55
- “Connecting Data and Management Cables” on page 61

USB Ports

Two USB 3.0 ports are located at the rear panel. Two additional USB 3.0 ports are located on the main module and are accessible from the front panel. See the location of the USB ports at “Front Panel Components” on page 13 and “Rear Panel Components” on page 14. The USB ports support hot-plugging. You can connect and disconnect USB cables and peripheral devices while the server is running without affecting server operations.

Each USB port supplies 5V output at 500 mA.



Pin	Signal Description	Pin	Signal Description
A1	+5 V (fused)	B1	+5 V (fused)
A2	USB0/1-	B2	USB2/3-
A3	USB0/1+	B3	USB2/3+
A4	Ground	B4	Ground

Related Information

- “Server Overview” on page 12
- “Front Panel Components” on page 13
- “Rear Panel Components” on page 14
- “Cabling Requirements” on page 55
- “Connecting Data and Management Cables” on page 61

SER MGT Ports

The SER MGT RJ-45 port, located on the rear panel, provides an TIA/EIA-232 serial Oracle/Cisco standard connection to the SP. This port is the default connection to the Oracle ILOM system controller. For DTE to DTE communications, you can use the supplied RJ-45 to DB-9 crossover adapter with a standard RJ-45 cable to achieve the required null modem configuration. See “Rear Panel Components” on page 14.

An additional SER MGT port is located on the main module and is accessible from the front panel. See “Front Panel Components” on page 13.

Pin	Signal Description	Pin	Signal Description
1	Request to Send	5	Ground
2	Data Terminal Ready	6	Receive Data
3	Transmit Data	7	Data Set Ready

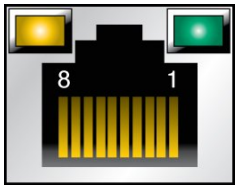
Pin	Signal Description	Pin	Signal Description
4	Ground	8	Clear to Send

Related Information

- “Server Overview” on page 12
- “Front Panel Components” on page 13
- “Rear Panel Components” on page 14
- “Connect the SER MGT Cable” on page 62
- “Connect a Terminal or Emulator to the SER MGT Port” on page 68

NET MGT Port

The NET MGT RJ-45 port, located on the rear panel, provides an optional Ethernet connection to the SP. The NET MGT port is an optional connection to the Oracle ILOM SP. The SP NET MGT port uses an RJ-45 cable for a 10/100BASE-T connection. If your network does not use a DHCP server, this port will not be available until you configure network settings through the SER MGT port. See “Rear Panel Components” on page 14.



Pin	Signal Description	Pin	Signal Description
1	Transmit Data +	5	Common Mode Termination
2	Transmit Data –	6	Receive Data –
3	Receive Data +	7	Common Mode Termination
4	Common Mode Termination	8	Common Mode Termination

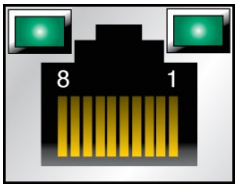
Related Information

- “Server Overview” on page 12
- “Rear Panel Components” on page 14
- “Connect the NET MGT Cable” on page 63

- “Assign a Static IP Address to the NET MGT Port” on page 80

Gigabit Ethernet Ports

Four RJ-45 10-Gigabit full-duplex auto-negotiating Ethernet ports (NET0, NET1, NET2, NET3) are located on the system rear panel. See “Rear Panel Components” on page 14. The Ethernet interfaces operate at 100 Mbit/sec, 1000 Mbit/sec, and 10000 Mbit/sec.



Pin	Signal Description	Pin	Signal Description
1	Transmit/Receive Data 0 +	5	Transmit/Receive Data 2 –
2	Transmit/Receive Data 0 –	6	Transmit/Receive Data 1 –
3	Transmit/Receive Data 1 +	7	Transmit/Receive Data 3 +
4	Transmit/Receive Data 2 +	8	Transmit/Receive Data 3 –

Related Information

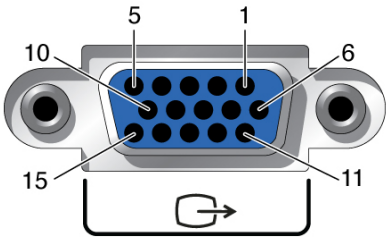
- “Server Overview” on page 12
- “Rear Panel Components” on page 14
- “Connect the Ethernet Network Cables” on page 63

VGA Port

The server has two 15-pin VGA video ports, one port on the front and one on the back of the server. See “Front Panel Components” on page 13 and “Rear Panel Components” on page 14. Use a HD-15 video cable to connect to a video adapter to achieve the required connection.

Note - Only one of the two ports can be used at a time. The rear VGA port is disabled by default. To enable the rear port and disable the front port, you must enable the Oracle ILOM `VGA_REAR_PORT` policy: `-> set /SP/policy VGA_REAR_PORT=enabled`.

Note - The cable length used to connect between the monitor and the VGA port should not be over 6 meters.



Pin	Signal Description	Pin	Signal Description
1	Red Video	9	[KEY]
2	Green Video	10	Sync Ground
3	Blue Video	11	Monitor ID - Bit 1
4	Monitor ID - Bit 2	12	VGA 12C Serial Data
5	Ground	13	Horizontal Sync
6	Red Ground	14	Vertical Sync
7	Green Ground	15	VGA 12C Serial Clock
8	Blue Ground		

Related Information

- “Rear Panel Components” on page 14
- “Cabling Requirements” on page 55
- “Connecting the Server Cables”

Connecting Data and Management Cables

After you have connected these cables, see “Powering On the Server for the First Time” before connecting the AC power cords.

Caution - Use only the power cords provided with the server.

- “Connect the SER MGT Cable” on page 62

- "Connect the NET MGT Cable" on page 63
- "Connect the Ethernet Network Cables" on page 63
- "Connect Other Data Cables" on page 64

Related Information

- "Front Panel Components" on page 13
- "Rear Panel Components" on page 14
- "Cabling Requirements" on page 55
- "Identifying Ports" on page 57

▼ Connect the SER MGT Cable

The serial management port on the SP is marked SER MGT. The SP SER MGT port is only used for server management. It is the default connection between the SP and a terminal or a computer. See "Front Panel Components" on page 13 and "Rear Panel Components" on page 14 for connector locations.

Caution - Do not attach a modem to the SP SER MGT port.

- **Connect an RJ-45 cable (Category 5) from the SP SER MGT port to the terminal device.**

  Use this port for initial server management. This port is needed to activate the NET MGT port, as detailed in "Powering On the Server for the First Time".

  When connecting either a DB-9 or a DB-25 cable, use the appropriate crossover cable adapter to create the required null modem configuration.

Note - To achieve 1-GbE network speeds, use Category 6 (or better) cables and network devices that support 1000BASE-T networks.

Related Information

- "Cabling Requirements" on page 55
- "Server Overview" on page 12
- "Front Panel Components" on page 13
- "Rear Panel Components" on page 14
- "Connect a Terminal or Emulator to the SER MGT Port" on page 68

▼ Connect the NET MGT Cable

The SP network management port is labeled NET MGT. After the initial server configuration, you can connect to the SP over an Ethernet network using this NET MGT port.

If your network uses a DHCP server to assign IP addresses, the DHCP server will assign an IP address to this NET MGT port. With this IP address, you can connect to the SP using an SSH connection. If your network does not use DHCP, this NET MGT port will not be accessible until you configure the network settings through the SER MGT port. For instructions, see "Assign a Static IP Address to the NET MGT Port" on page 80.

- **Connect the NET MGT port to your network switch or hub using a Category 5 (or better) cable.**

  See "Rear Panel Components" on page 14 for connector locations.

  The NET MGT port is not operational until you configure the network settings through the SER MGT port as detailed in "Connect a Terminal or Emulator to the SER MGT Port" on page 68.

Note - The NET MGT port is configured by default to retrieve network settings with DHCP and to enable connections using SSH. You might need to modify these settings for your network. Information related to changing these settings are in "Powering On the Server for the First Time".

Related Information

- "Connect a Terminal or Emulator to the SER MGT Port" on page 68
- "SER MGT Ports" on page 58

▼ Connect the Ethernet Network Cables

The server has four RJ-45 network connectors labeled NET0, NET1, NET2, and NET3. Use these ports to connect the server to the network. The Ethernet interfaces operate at 100 Mbps, 1000 Mbps, and 10000 Mbps. See "Rear Panel Components" on page 14 for port locations.

Note - The Oracle ILOM sideband management feature enables you to access the SP using one of these Ethernet ports. Refer to the administration guide for your server for instructions.

Note - To achieve 1-GbE network speeds, use Category 6 (or better) cables and network devices that support 1000BASE-T networks.

---

1. **Connect a Category 5 (or better) cable from your network switch or hub to Ethernet Port 0 (NET0) on the rear of the chassis.**

2. **Connect Category 5 (or better) cables from your network switch or hub to the remaining Ethernet ports (NET1, NET2, NET3) as needed.**

Related Information

- Servers Administration
- “Powering On the Server for the First Time”

▼ Connect Other Data Cables

- **If the server is configured with additional I/O components, connect the external cables to the connectors contained on those components.**

Related Information

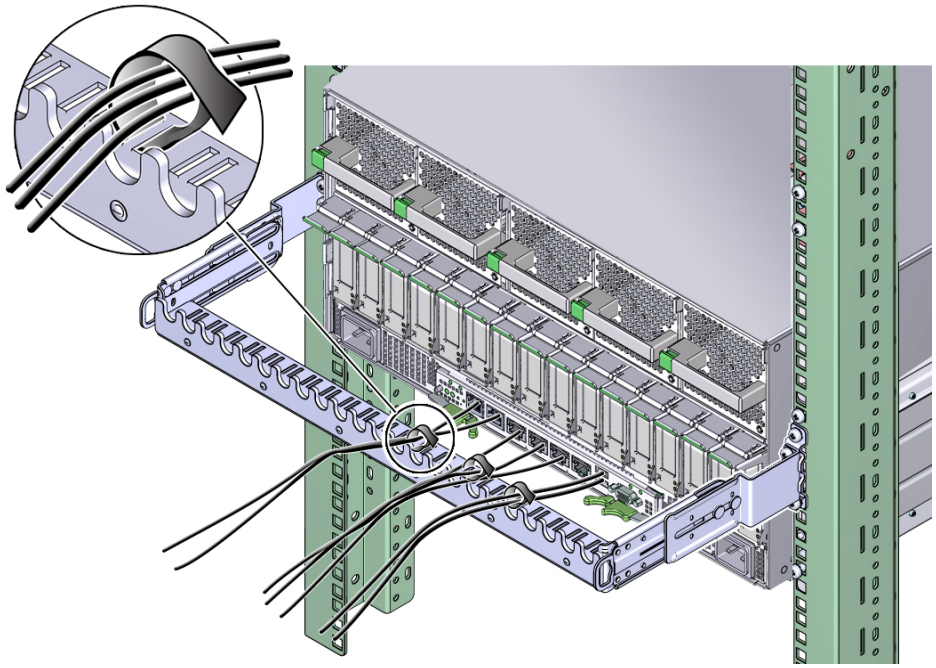
- PCIe card documentation
- Server Service

▼ Secure Cables Using the CMA

Use the CMA to secure cables and ensure proper cable routing.

1. **Remove the CMA cover.**

The CMA cover is secured with two No. 2 Phillips screws.



2. **Place the system cables into the appropriate slots in the CMA.**

   See “Connecting the Server Cables”.

3. **Install the CMA cover.**

   Secure the cover using two No. 2 Phillips screws.

Related Information

- “CMA Kit (CMA Comb, Part Number 7069793)” on page 43
- “Cabling Requirements” on page 55

Powering On the Server for the First Time

These topics include instructions for powering on the server for the first time and configuring the Oracle Solaris OS.

Step	Description	Links
1.	Prepare the power cords.	“Prepare the Power Cords” on page 67
2.	Connect a serial terminal device or terminal server to the SER MGT port.	“Connect a Terminal or Emulator to the SER MGT Port” on page 68
3.	Power on the server and start the Oracle ILOM system console.	“Power on the System for the First Time” on page 70 or “Configure the Preinstalled OS” on page 72
4.	Configure the preinstalled OS, or install a fresh OS.	“Configure the Preinstalled OS” on page 72 or “Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)” on page 75
5.	Set the configuration parameters for the Oracle Solaris OS.	“Oracle Solaris OS Configuration Parameters” on page 77
6. (Optional)	Configure the NET MGT port to use a static IP address.	“Assign a Static IP Address to the NET MGT Port” on page 80

Related Information

- “Understanding the Server”
- “Installing the Server”
- “Connecting Data and Management Cables” on page 61

▼ Prepare the Power Cords

Prepare the power cords by routing them from the AC power source to the server.

Caution - Use only the power cords provided with the server.

Caution - Do not attach power cables to the power supplies until you have connected the server to a serial terminal or a terminal emulator (PC or workstation). The server goes into Standby mode and the Oracle ILOM SP initializes as soon as a power cable connects a power supply to an external power source. System messages might be lost after 60 seconds if a terminal or terminal emulator is not connected to the SER MGT port before power is applied.

Note - Oracle ILOM will signal a fault if both power supplies are not cabled at the same time, since it will be a nonredundant condition. Do not be concerned with this fault in this situation.

- **Route the power cords from the AC power source to the rear of the server.**

  Do not attach the power cords to the power supplies at this time.

Related Information

- "Rear Panel Components" on page 14
- "Powering On the Server for the First Time"

▼ Connect a Terminal or Emulator to the SER MGT Port

Prior to powering on the server for the first time, make a serial connection to the SP from a terminal or terminal emulator. After making this serial connection, you will be able to view the system messages when you connect the power cords.

1. **Confirm that you have completed the following tasks:**

   a. **Completed the preparation for installation.**

      See "Preparing for Installation".

   b. **Completed the installation of the server in a rack.**

      See "Installing the Server".

   c. **Connected the necessary cables.**

      See "Connecting the Server Cables"

2. **Connect a terminal or a terminal emulator (PC or workstation) to the server SER MGT port.**

3. **Configure a terminal or terminal emulator with these settings:**

   - **9600 baud**

- **8 bits**
- **No parity**
- **1 Stop bit**
- **No handshake**

A null modem configuration is needed, meaning the transmit and receive signals are reversed (crossed over) for DTE to DTE communications. You can use the supplied RJ-45 crossover adapters with a standard RJ-45 cable to achieve the null modem configuration.

Note - If you power on the server for the first time and do not have a terminal or terminal emulator (PC or workstation) connected to the SER MGT port, you will not see system messages.

---

4. **(Optional) Connect an Ethernet cable between the server's NET MGT port and the network to which future connections to the SP and host will be made.**

   Configure the system for the first time through the SER MGT port. After the initial configuration, you can set up communication between the SP and host through this Ethernet interface.

5. **Connect an Ethernet cable between one of the server's NET ports and the network to which the server will communicate.**

6. **Connect the power cords to the power supplies and to separate power sources.**

   When the power cords are connected, the SP initializes and the power supply LEDs illuminate. After a few minutes, the SP login prompt is displayed on the terminal device. At this time, the host is not initialized or powered on.

7. **Continue with the installation by powering on the server for the first time.**

   See “Power on the System for the First Time” on page 70.

Related Information

- “Connect the SER MGT Cable” on page 62
- “Configure the Preinstalled OS” on page 72
- “Reach a State to Install a Fresh OS (Oracle ILOM CLI)” on page 73
- “Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)” on page 75

Power on the System for the First Time

1. **At the terminal device, log in to the SP as `root` with a password of `changeme`.**

```
XXXXXXXXXXXXXXXX login: root
Password: changeme (     nothing
displayed)
. . .
->
```

After a brief delay, the Oracle ILOM prompt is displayed (`->`).

Note - To enable first-time login and access to Oracle ILOM, a default Administrator account and its password are provided with the system. To build a secure environment, you must change the default password (**`changeme`**) for the default Administrator account (`root`) after your initial login to Oracle ILOM. If this default Administrator account has been changed, contact your system administrator for an Oracle ILOM user account with Administrator privileges.

For more information about the administration tasks such as changing passwords, adding accounts, and setting account privileges, refer to the Oracle ILOM documentation.

Note - By default, the SP is configured to use DHCP to obtain an IP address. If you plan to assign a static IP address to the SP, see"Assign a Static IP Address to the NET MGT Port" on page 80 for more instructions.

---

2. **Power on the server using one of the following methods:**

   - **Press the power button.**
   - **At the Oracle ILOM prompt, type:**

```
-> start /System
Are you sure you want to start /System (y/n)? y
```

The server initialization might take several minutes to complete.

To cancel the initialization, press the #. (Hash+Dot) keys to return to the Oracle ILOM prompt. Then type: `stop /System`

Note - In Oracle ILOM 3.1, the name space for `/SYS` was replaced with `/System`. You can use the legacy name in a command at any time, but to expose the legacy name in the output, you must enable it with `-> set /SP/cli legacy_targets=enabled`. For more information, see the Oracle ILOM 3.1 documentation.

---

3. **(Optional) Redirect the host output to display on the serial terminal device.**

```
-> start /HOST/console
Are you sure you want to start /SP/console (y/n)? y
Serial console started.
. . .
```

4. **(Optional) You can execute other Oracle ILOM commands while the server initializes.**

   a. **To display the Oracle ILOM prompt, press the #. (Hash+Dot) keys.**

   b. **To see information about available Oracle ILOM commands, type:** `help`

   To see information about a specific command, type help command-name

   c. **To return to displaying host output from the server initialization, type:**

```
-> start /HOST/console
```

5. **Continue with the installation by installing the OS.**

   See “Configure the Preinstalled OS” on page 72.

Related Information

- “Connect the SER MGT Cable” on page 62
- “Oracle ILOM System Console” on page 71
- “Configure the Preinstalled OS” on page 72
- “Reach a State to Install a Fresh OS (Oracle ILOM CLI)” on page 73
- “Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)” on page 75

Oracle ILOM System Console

When power is first applied to the system, the boot process begins under the control of the Oracle ILOM system console. The system console displays status and error messages generated by firmware-based tests that are run during system startup.

Note - To see these status and error messages, connect a terminal or terminal emulator to the SER MGT before applying power to the server.

After the system console finishes its low-level system diagnostics, the SP initializes and runs a suite of higher level diagnostics. When you access the SP using a device connected to the SER MGT port, you see the output of the Oracle ILOM diagnostics.

By default, the SP configures the NET MGT port automatically, retrieving network configuration settings using DHCP and allowing connections using SSH.

For a more detailed discussion on configuring the system console and connecting terminals, refer to the administration guide for your server.

Related Information

- Servers Administration
- Oracle ILOM documentation
- “Configure the Preinstalled OS” on page 72
- “Reach a State to Install a Fresh OS (Oracle ILOM CLI)” on page 73
- “Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)” on page 75
- “Assign a Static IP Address to the NET MGT Port” on page 80

Installing the OS

Use these topics to either configure the preinstalled OS or use an alternative OS.

- “Configure the Preinstalled OS” on page 72
- “Reach a State to Install a Fresh OS (Oracle ILOM CLI)” on page 73
- “Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)” on page 75

Related Information

- “Oracle Solaris OS Configuration Parameters” on page 77

▼ Configure the Preinstalled OS

1. **Determine which OS you will use.**

   - **If you plan to use the preinstalled OS, proceed to step 2.**
   - **If you do not plan to use the preinstalled OS, go to “Reach a State to Install a Fresh OS (Oracle ILOM CLI)” on page 73.**

2. **When prompted, follow the onscreen instructions for configuring the Oracle Solaris OS on your host.**

   You will be prompted to confirm the configuration several times, enabling confirmation and changes. If you are not sure how to respond to a particular value, you can accept the default, and make future changes when the Oracle Solaris OS is running. See "Oracle Solaris OS Configuration Parameters" on page 77 for a description of the Oracle Solaris OS parameters you must provide during initial configuration.

3. **Log in to the server.**

   You can now enter Oracle Solaris OS commands at the prompt. For more details, refer to the Oracle Solaris 11 or 10 OS man pages and documentation at:

   http://www.oracle.com/goto/Solaris11/docs

   http://www.oracle.com/goto/Solaris10/docs

Related Information

- "Prepare the Power Cords" on page 67
- "Connect a Terminal or Emulator to the SER MGT Port" on page 68
- "Power on the System for the First Time" on page 70
- "Oracle Solaris OS Configuration Parameters" on page 77

▼ Reach a State to Install a Fresh OS (Oracle ILOM CLI)

If you do not plan to use the preinstalled OS use this procedure to prevent the server from booting from the preinstalled OS. You can perform this alternative procedure after reading Step 5 in "Configure the Preinstalled OS" on page 72.

1. **Prepare the appropriate boot media according to your installation method.**

   There are many methods by which you can install the OS. For example, you can boot and install the OS from DVD media or from another server on the network.

   For more information about the methods, refer to these Oracle Solaris document sections:

   - *Installing Oracle Solaris 11 Systems*, comparing installation options at:

     `http://www.oracle.com/goto/Solaris11/docs`
   - *Oracle Solaris 10 Installation Guide: Planning for Installation and Upgrade*, choosing an Oracle Solaris installation method at:

     `http://www.oracle.com/goto/Solaris10/docs`

2. **From Oracle ILOM, set the OpenBoot `auto-boot?` parameter to `false`.**

```
-> set /HOST/bootmode script="setenv auto-boot? false"
```

This setting prevents the server from booting from the preinstalled OS. When you use `bootmode`, the change applies only to a single boot and expires in 10 minutes if the power on the host is not reset.

3. When you are ready to initiate the OS installation, reset the host.

```
-> reset /System
Are you sure you want to reset /System (y/n)? y
Performing reset on /System
```

Note - In Oracle ILOM 3.1, the name space for `/SYS` was replaced with `/System`. You can use the legacy name in command at any time, but to expose the legacy name in the output, you must enable it with `-> set /SP/cli legacy_targets=enabled`. For more information, see the Oracle ILOM 3.1 documentation.

---

4. Switch communication to the server host.

```
-> start /HOST/console
Are you sure you want to start /HOST/console (y/n)? y
Serial console started. To stop, type #.
```

The server might take several minutes to complete POST, and then the OpenBoot prompt (`ok`) is displayed.

5. Boot from the appropriate boot media for your installation method.

For more information, refer to the Oracle Solaris installation guide that corresponds to your desired release and installation method.

- *Installing Oracle Solaris 11 Systems*, comparing installation options at:

  http://www.oracle.com/goto/Solaris11/docs
- *Oracle Solaris 10 Installation Guide: Planning for Installation and Upgrade*, choosing an Oracle Solaris installation method at:

  http://www.oracle.com/goto/Solaris10/docs

For a list of valid boot commands, type:

```
{0} ok help boot
boot <specifier>  ( -- )    boot kernel ( default ) or other file
  Examples:
    boot                    - boot kernel from default device.
                              Factory default is to boot
                              from DISK if present, otherwise from NET.
```

```
    boot net                - boot kernel from network
    boot cdrom              - boot kernel from CD-ROM
    boot disk1:h            - boot from disk1 partition h
    boot tape               - boot default file from tape
    boot disk myunix -as    - boot myunix from disk with flags "-as"
dload <filename>  ( addr -- )     debug load of file over network at address
  Examples:
     4000 dload /export/root/foo/test
     ?go        - if executable program, execute it
                  or if Forth program, compile it
```

Related Information

- “Configure the Preinstalled OS” on page 72
- “Reach a State to Install a Fresh OS (Oracle ILOM CLI)” on page 73
- “Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)” on page 75
- “Assign a Static IP Address to the NET MGT Port” on page 80

▼ Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)

If you do not plan to use the preinstalled OS, use this procedure to prevent the server from booting from the preinstalled OS.

1. **Prepare the appropriate boot media according to your installation method.**

   There are many methods by which you can install the OS. For example, you can boot and install the OS from DVD media or from another server on the network.

   For more information about the methods, refer to these Oracle Solaris document sections:

   - *Installing Oracle Solaris 11 Systems*, comparing installation options at:

     `http://www.oracle.com/goto/Solaris11/docs`
   - *Oracle Solaris 10 Installation Guide: Planning for Installation and Upgrade*, choosing an Oracle Solaris installation method at:

     `http://www.oracle.com/goto/Solaris10/docs`

2. **If you have not done so, perform these tasks to access the Oracle ILOM web interface on the server:**

   a. **In a browser on the same network as the system, type the IP address of the SP.**

   b. **Log in to Oracle ILOM by typing your user name and password.**

3. **In the Oracle ILOM web interface, in the left navigation pane, choose Host Management > Host Boot Mode.**

   The Host Boot Mode page is displayed.

4. **Apply these changes to the Host Boot Mode Settings:**

   a. **For State, select: Reset NVRAM**

      This setting applies a one-time NVRAM (OpenBoot) change based on the script setting, then resets the NVRAM to default settings on the next host reset.

   b. **For Script, type:** `setenv auto-boot? false`

      This setting configures the host to stop at the `ok` prompt instead of automatically booting the preinstalled OS.

   c. **Click Save.**

   Note - You have 10 minutes to perform the next step. After 10 minutes, the state is automatically returned to normal.

5. **In the left navigation panel, click on Host Management > Power Control.**

6. **Select Reset from the pull-down menu, and click Save.**

7. **In the left navigation panel, click on Remote Control > Redirection.**

8. **Select Use Serial Redirection, and click Launch Remote Console.**

   As the host resets, messages are displayed in the serial console. The reset activity takes a few minutes to complete. When the `ok` prompt is displayed, continue to the next step.

9. **At the `ok` prompt, boot from the appropriate boot media for your installation method.**

   For more information, refer to the Oracle Solaris installation guide that corresponds to your desired release and installation method.

   - *Installing Oracle Solaris 11 Systems*, comparing installation options at:

     `http://www.oracle.com/goto/Solaris11/docs`
   - *Oracle Solaris 10 Installation Guide: Planning for Installation and Upgrade*, choosing an Oracle Solaris installation method at:

     `http://www.oracle.com/goto/Solaris10/docs`

   For a list of valid boot commands that you can enter at the OpenBoot prompt, type:

```
{0} ok help boot
boot <specifier>  ( -- )    boot kernel ( default ) or other file
  Examples:
    boot                    - boot kernel from default device.
                              Factory default is to boot
                              from DISK if present, otherwise from NET.
    boot net                - boot kernel from network
    boot cdrom              - boot kernel from CD-ROM
    boot disk1:h            - boot from disk1 partition h
    boot tape               - boot default file from tape
    boot disk myunix -as    - boot myunix from disk with flags "-as"
dload <filename>  ( addr -- )     debug load of file over network at address
  Examples:
     4000 dload /export/root/foo/test
     ?go        - if executable program, execute it
                  or if Forth program, compile it
```

Related Information

- “Configure the Preinstalled OS” on page 72
- “Reach a State to Install a Fresh OS (Oracle ILOM CLI)” on page 73
- “Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)” on page 75
- “Assign a Static IP Address to the NET MGT Port” on page 80

Oracle Solaris OS Configuration Parameters

This topic describes configuration parameters you must provide during initial Oracle Solaris OS configuration.

Parameter	Description
Language	Select a number from the displayed language list.
Locale	Select a number from the displayed locale list.
Terminal Type	Select a terminal type that corresponds with your terminal device.
Network?	Select Yes.
Multiple Network Interfaces	Select the network interfaces that you plan to configure. If you are not sure, select the first one in the list.
DHCP?	Select Yes or No according to your network environment.
Host Name	Type the host name for the server.
IP Address	Type the IP address for this Ethernet interface.
Subnet?	Select Yes or No according to your network environment.
Subnet Netmask	(If subnet was Yes) Type the netmask for the subnet for your network environment.
IPv6?	Specify whether or not to use IPv6. If you are not sure, select No to configure the Ethernet interface for IPv4.
Security Policy	Select either standard UNIX security (No) or Kerberos Security (Yes). If you are not sure, select No.

Parameter	Description
Confirm	Review the onscreen information and change it if needed. Otherwise, continue.
Name Service	Select the name service according to your network environment. If you select a name service other than None, you will be prompted for additional name service configuration information.
NFSv4 Domain Name	Select the type of domain name configuration according to your environment. If you are not sure, select `Use the NFSv4 domain derived by the system.`
Time Zone (Continent)	Select your continent.
Time Zone (Country or Region)	Select your country or region.
Time Zone	Select the time zone.
Date and Time	Accept the default date and time or change the values.
root Password	Type the `root` password twice. This password is for the superuser account for the Oracle Solaris OS on this server. This password is not the SP password.

Related Information

- Oracle Solaris OS documentation
- “Configure the Preinstalled OS” on page 72
- “Reach a State to Install a Fresh OS (Oracle ILOM CLI)” on page 73
- “Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)” on page 75

Assigning a Static IP Address to the SP

If your network does *not* use DHCP, the NET MGT port is not operational until you configure network settings for the SP.

Note - If you are unable to use DHCP on your network, you must connect to the ILOM SP using the SER MGT port to configure the NET MGT port for your network. See “Assign a Static IP Address to the NET MGT Port” on page 80.

- “Log In to the SP (SER MGT Port)” on page 79

Related Information

- “Oracle ILOM System Console” on page 71
- “Oracle Solaris OS Configuration Parameters” on page 77
- “Log In to the SP (SER MGT Port)” on page 79

- “Assign a Static IP Address to the NET MGT Port” on page 80

▼ Log In to the SP (SER MGT Port)

After the SP boots, access the ILOM CLI to configure and manage the server. The ILOM CLI prompt (`->`) is displayed the first time the SP is booted. The default configuration provides an ILOM CLI `root` user account. The default `root` password is **`changeme`**. Change the password using the SP ILOM CLI password command.

1. **If this is the first time the server has been powered on, use the `password` command to change the `root` password.**

```
hostname login: root
Password:changeme (     nothing
displayed)
Last login: Mon Feb 18 16:53:14 GMT 2013 on ttyS0
Detecting screen size; please wait...done

Oracle(R) Integrated Lights Out Manager

Version 3.2.1.2 rxxxxx

Copyright (c) 2013, Oracle and/or its affiliates. All rights reserved.
Warning: password is set to factory default.

-> set /SP/users/root password
Enter new password: ********
Enter new password again: ********

->
```

Note - After the `root` password has been set, on subsequent reboots, the ILOM CLI login prompt is displayed.

2. **Type `root` for the login name, followed by your password.**

```
...
hostname login: root
Password: ******** (     nothing
displayed)

Oracle(R) Integrated Lights Out Manager

Version 3.2.1.2
```

```
Copyright (c) 2013 Oracle and/or its affiliates. All rights reserved.
->
```

Related Information

- Servers Administration
- “Rear Panel Components” on page 14
- “Cabling Requirements” on page 55
- Oracle ILOM documentation

▼ Assign a Static IP Address to the NET MGT Port

If you plan to connect to the SP through its NET MGT port, the SP must have a valid IP address.

By default, the server is configured to obtain an IP address from DHCP services in your network. If the network your server is connected to does not support DHCP for IP addressing, perform this procedure.

Note - To configure the server to support DHCP, refer to the Oracle ILOM documentation.

1. **Set the SP to accept a static IP address.**

```
-> set /SP/network pendingipdiscovery=static
Set 'pendingipdiscovery' to 'static'
```

2. **Set the IP address for the SP.**

Oracle ILOM is shipped with IPv4 DHCP and IPv6 Stateless default network settings.

   a. **To change the default IPv4 DHCP property and set property values for a static IPv4 address, type IPv4_address.**

   b. **To change the default IPv6 DHCP property and set property values for a static IPv6 address, type IPv6_address.**

      This setting configures the host to stop at the `ok` prompt instead of automatically booting the preinstalled OS.

```
-> set /SP/network pendingipaddress=service-processor-IPaddr
Set 'pendingipaddress' to ' service-processor-IPaddr'
```

For more information about the administration tasks such as modifying default network connectivity settings, refer to the Oracle ILOM documentation.

3. **Set the IP address for the SP gateway.**

```
-> set /SP/network pendingipgateway=gateway-IPaddr
Set 'pendingipgateway' to 'gateway-IPaddr'
```

4. **Set the netmask for the SP.**

```
-> set /SP/network pendingipnetmask=255.255.255.0
Set 'pendingipnetmask' to '255.255.255.0'
```

This example uses `255.255.255.0` to set the netmask. Your network environment subnet might require a different netmask. Use a netmask number most appropriate to your environment.

5. **Verify that the pending parameters are set correctly.**

```
-> show /SP/network
  /SP/network
     Targets:
     Properties:
        commitpending = (Cannot show property)
        dhcp_clientid = xxx.xxx.xxx.xxx
        dhcp_server_ip = xxx.xxx.xxx.xxx
        ipaddress = xxx.xxx.xxx.xxx
        ipdiscovery = dhcp
        ipgateway = xxx.xxx.xxx.xxx
        ipnetmask = 255.255.255.0
        macaddress = xx:xx:xx:xx:xx:xx
        managementport = MGMT
        outofbandmacaddress = xx:xx:xx:xx:xx:xx
        pendingipaddress = service-processor-IPaddr
        pendingipdiscovery = static
        pendingipgateway = gateway-IPaddr
        pendingipnetmask = 255.255.255.0
        pendingmanagementport = MGMT
        sidebandmacaddress = xx:xx:xx:xx:xx:xx
        state = enabled
```

6. **Set the changes to the SP network parameters.**

```
-> set /SP/network commitpending=true
Set 'commitpending' to 'true'
```

Note - You can type the `show /SP/network` command again to verify that the parameters have been updated.

7. **Set the static IP address when you configure the Oracle Solaris OS.**

See "Configure the Preinstalled OS" on page 72.

Related Information

- Servers Administration
- “Configure the Preinstalled OS” on page 72
- “Reach a State to Install a Fresh OS (Oracle ILOM CLI)” on page 73
- “Reach a State to Install a Fresh OS (Oracle ILOM Web Interface)” on page 75
- “Oracle Solaris OS Configuration Parameters” on page 77
- Oracle ILOM documentation

Glossary

A

ANSI SIS American National Standards Institute Status Indicator Standard.

ASF Alert standard format (Netra products only).

AWG American wire gauge.

B

blade Generic term for server modules and storage modules. *See* server module *and* storage module.

blade server Server module. See server module.

BMC Baseboard management controller.

BOB Memory buffer on board.

C

chassis For servers, refers to the server enclosure. For server modules, refers to the modular system enclosure.

CMA Cable management assembly.

CMM Chassis monitoring module (server modules only). The CMM is the service processor in the modular system that contains server modules. Oracle ILOM runs on the CMM, providing lights out management of the components in the modular system chassis. *See* modular system *and* Oracle ILOM.

CMP Chip multiprocessor.

D

DHCP Dynamic Host Configuration Protocol.

disk module or disk blade Interchangeable terms for storage module. *See* storage module.

DTE Data terminal equipment.

E

EIA Electronics Industries Alliance.

ESD Electrostatic discharge.

F

FEM Fabric expansion module (server modules only). FEMs enable server modules to use the 10GbE connections provided by certain NEMs. *See* NEM.

FRU Field-replaceable unit.

H

HBA Host bus adapter.

host The part of the server or server module with the CPU and other hardware that runs the Oracle Solaris OS and other applications. The term *host* is used to distinguish the primary computer from the SP. *See* SP.

hot-pluggable Describes a component that can be replaced with power applied, but the component must be prepared for removal.

hot-swappable Describes a component that can be replaced with power applied, and no preparation is required.

I

ID PROM Chip that contains system information for the server or server module.

IP Internet Protocol.

K

KVM Keyboard, video, mouse. Refers to using a switch to enable sharing of one keyboard, one display, and one mouse with more than one computer.

L

LwA Sound power level.

M

MAC Machine access code.

MAC address Media access controller address.

modular system The rackmountable chassis that holds server modules, storage modules, NEMs, and PCI EMs (server modules only). The modular system provides Oracle ILOM through its CMM.

MSGID Message identifier.

N

name space Top-level Oracle ILOM target.

NEBS Network Equipment-Building System (Netra products only).

NEM Network express module (server modules only). NEMs provide Ethernet and SAS connectivity to storage modules.

NET MGT Network management port. An Ethernet port on the server SP, the server module SP, and the CMM.

NIC Network interface card or controller.

NMI Nonmaskable interrupt.

O

OBP OpenBoot PROM. Sometimes OBP is used in file names and messages to indicate a relationship to OpenBoot.

Oracle ILOM Oracle Integrated Lights Out Manager. Oracle ILOM firmware is preinstalled on a variety of Oracle systems. Oracle ILOM enables you to remotely manage your Oracle servers regardless of the state of the host system.

Oracle ILOM CMM Oracle ILOM that runs on the CMM (server modules only). *See* Oracle ILOM.

Oracle Solaris OS Oracle Solaris operating system.

P

PCI Peripheral component interconnect.

PEM PCIe ExpressModule (server modules only). Modular components that are based on the PCI Express industry-standard form factor and offer I/O features such as Gigabit Ethernet and Fibre Channel.

POST Power-on self-test.

PROM Programmable read-only memory.

PSH Predictive self healing.

R

REM RAID expansion module (server modules only). Sometimes referred to as an HBA *See* HBA. Supports the creation of RAID volumes on drives.

S

SAS Serial attached SCSI.

SCC System configuration chip.

SER MGT Serial management port. A serial port on the server SP, the server module SP, and the CMM.

server module Modular component that provides the main compute resources (CPU and memory) in a modular system. Server modules also might have on-board storage and connectors that hold FEMs.

SP Service processor. In the server or server module, the SP is a card with its own OS. The SP processes Oracle ILOM commands providing lights out management control of the host. *See* host.

SSD Solid-state drive.

SSH Secure shell.

storage module Modular component that provides computing storage to the server modules.

T

TIA Telecommunications Industry Association (Netra products only).

Tma Maximum ambient temperature.

U

U.S. NEC United States National Electrical Code.

UCP Universal connector port.

UI User interface.

UL Underwriters Laboratory Inc.

UTC Coordinated Universal Time.

UUID Universal unique identifier.

W

WWN World wide name. A unique number that identifies a SAS target.

Index

A

acoustic specifications, 20
adapters for serial cables, 62
`admin` login, setting password for, 79
airflow
  clearance, 20
  guidelines, 20
airflow guidelines, 20
altitude specifications, 19
anti-tilt legs or bar, 32

B

baud rate for serial terminal, 68
bits setting for serial terminal, 68

C

cable management assembly
  See CMA, 42
cabling
  adapters for serial data cables, 62
  Ethernet ports, 63
  NET MGT port, 63
  power cords, 67
  required connections, 55
  securing to CMA, 64
  SER MGT port, 63
clearance
  airflow, 20
  service, 20
CMA
  comb, 23
  installing, 42
  kit, 42
  multi-piece, 25, 42
  required hardware, 42
  securing cables, 64
CMA comb, 32
  installing, 44
compatible racks, 30, 30
components
  rear, 14

D

depth specifications, 17
DHCP, 63
diagnostics
  when run, 71
DIMMs
  DIMM description, 12
drives, 12
DVD drive, 12

E

electrical specifications, 18
elevation specifications, 19
environmental specifications, 19
ESD precautions, 27
Ethernet ports, 12
  cabling, 55

F

fasteners
  shipping bracket, 50

G

Gigabit Ethernet port pinouts, 60

H

handling precautions, 26
handshaking for serial terminal, no, 68
heat dissipation specification, 18
height specification, 17
hot-plugging USB ports, 55
humidity specification, 19

I

installing
  CMA, 42
  CMA comb, 44
  multi-piece CMA, 44
  rackmount hardware, 37
  rackmount kit, 32, 34
  server into rack, 53
  task overview, 11
IP address
  SP, 77

L

LEDs, ports, and slots illustrated, 14
locations of ports, slots, and LEDs (illustration), 14
logging into SP
  using SER MGT port, 79

M

messages retention, limits of, 55
minimum cable connections, 55
modem not for use with the SER MGT serial management port, 62

N

NET MGT port
  cabling, 63
  DHCP, 63
  location, 63
  pinouts, 59, 63
  static IP address, 63

O

Oracle ILOM, 71
Oracle Solaris OS
  configuration parameters, 77
  configuring the preinstalled OS, 72
  installing a fresh OS (Oracle ILOM CLI), 73
  installing a fresh OS (Oracle ILOM web interface), 75

P

parity for serial terminal, no, 68
`password` command, 79
physical, 17
pinouts
  Ethernet ports, 57
  Gigabit Ethernet ports, 60
  NET MGT port, 59
  SER MGT port, 58
  USB ports, 57, 57
  video connector, 57, 60
ports, slots, and LEDs illustrated, 14
Power button
  location of, 13
power calculator, 18
power cords, cabling, 67
power specifications, 55
precautions, handling, 26

R

rack
  cautions, 31
  compatibility, 30
  mounting holes, supported, 30
  stabilizing, 32
rackmount
  anti-tilt legs or bar, extending, 32
  installing the hardware, 37
  preparing the server, 28
  safety warnings, 31
  stabilizing the rack, 32

rackmount kit
  CMA comb, 32
  multi-piece CMA, 34
rackmounting, 29
racks, compatible, 30
racks, supported, 30
rear panel
  components, 14
RJ-45 cable, 55

S

SER MGT port
  cabling, 68
  initial power on, 68
  pinouts, 58
serial terminal settings, 68
server
  installing, 53
  overview, 12
service clearance, 17
service processor
  accessing with SER MGT port, 79
shipping bracket fasteners, 50
shipping kit
  CMA comb, 23
  multi-piece CMA, 23, 25
shipping kit contents, 23, 25
site planning specifications, 17
slots, ports, and LEDs illustrated, 14
specifications
  acoustic, 20
  confirming, 17
  electrical, 18
  elevation, 19
  environmental, 19
  height, 17
  humidity, 19
  physical, 17
  shock, 19
  site planning, 17
  vibration, 19
  weight, 17
  width, 17
standby
  mode, 67
standby mode, when AC connected, 55
stop bit, 68

T

terms
  slide rail assembly, 32, 34

U

USB ports, 12
  front, 13
  output power, 57
  pinouts, 57
  rear, 14

V

vibration specifications, 19
video connector
  described, 12
  front, 13
  HD-15 cable, 55
  pinouts, 60
  rear, 14

W

weight specifications, 17
width specifications, 17